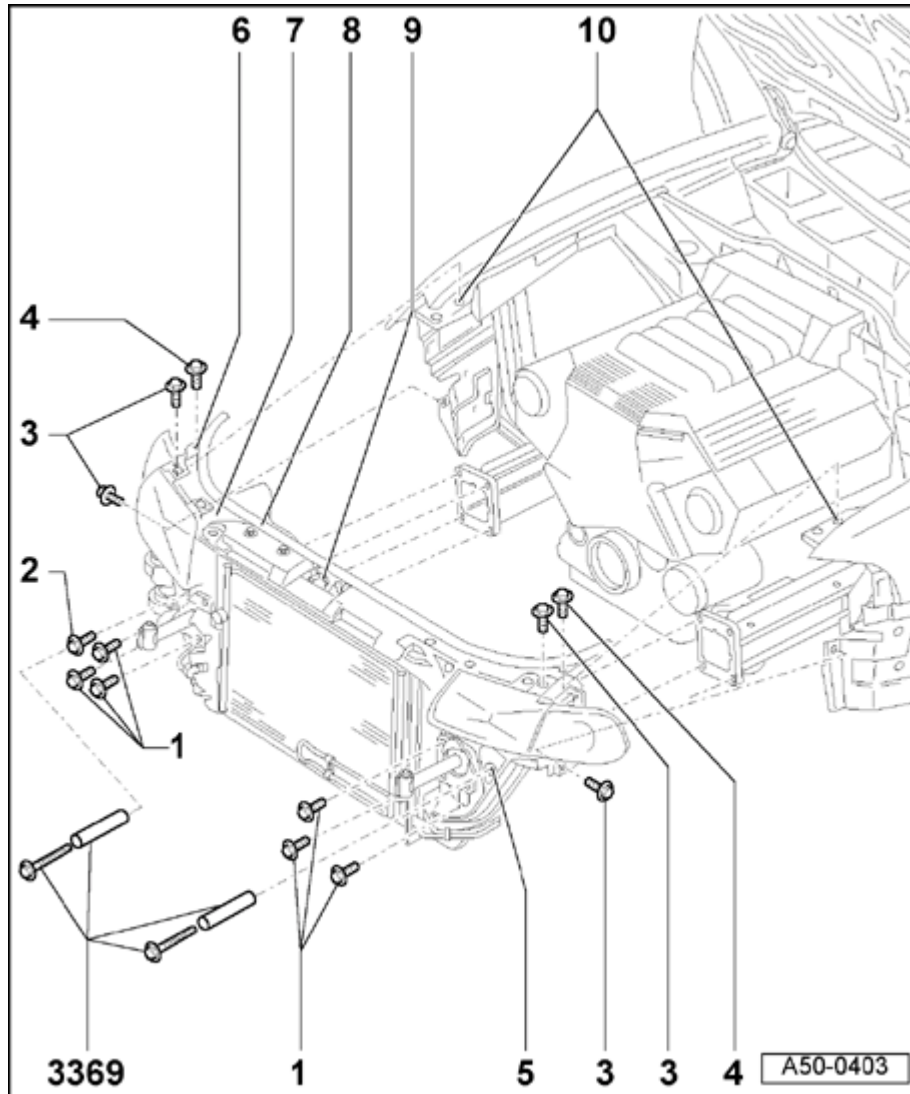




Body, front

Lock carrier with attachments, removing and installing

1 - Hex bolt (6x)

◆ 45 Nm (33 ft lb)

2 - Hex bolt

◆ 45 Nm (33 ft lb)

3 - Hex bolt (4x)

◆ 10 Nm (7 ft lb)

4 - Hex bolts (2x)

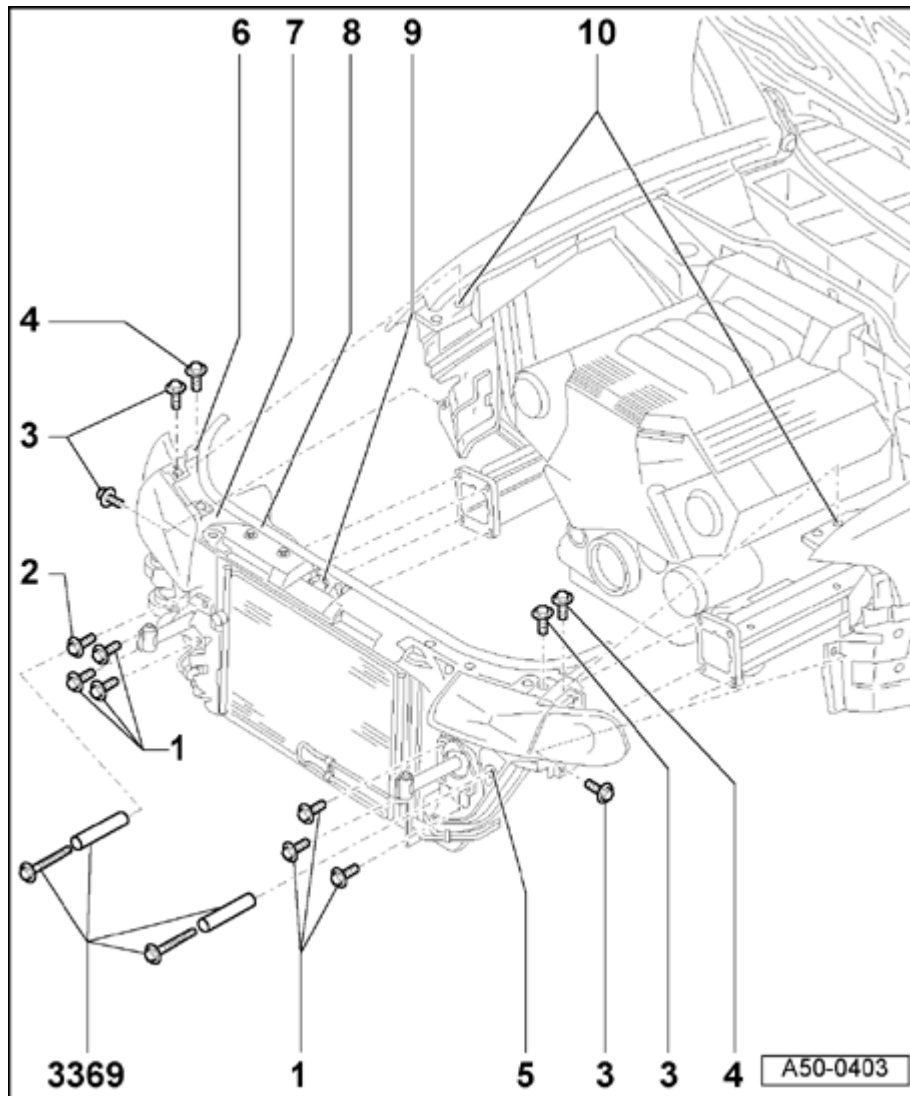
◆ 10 Nm (7 ft lb)

5 - Access hole for special tool

◆ For service position, attach special tool 3369 here

6 - Cowl attachment hole

◆ Attachment for service position



7 - Lock carrier

Removing:

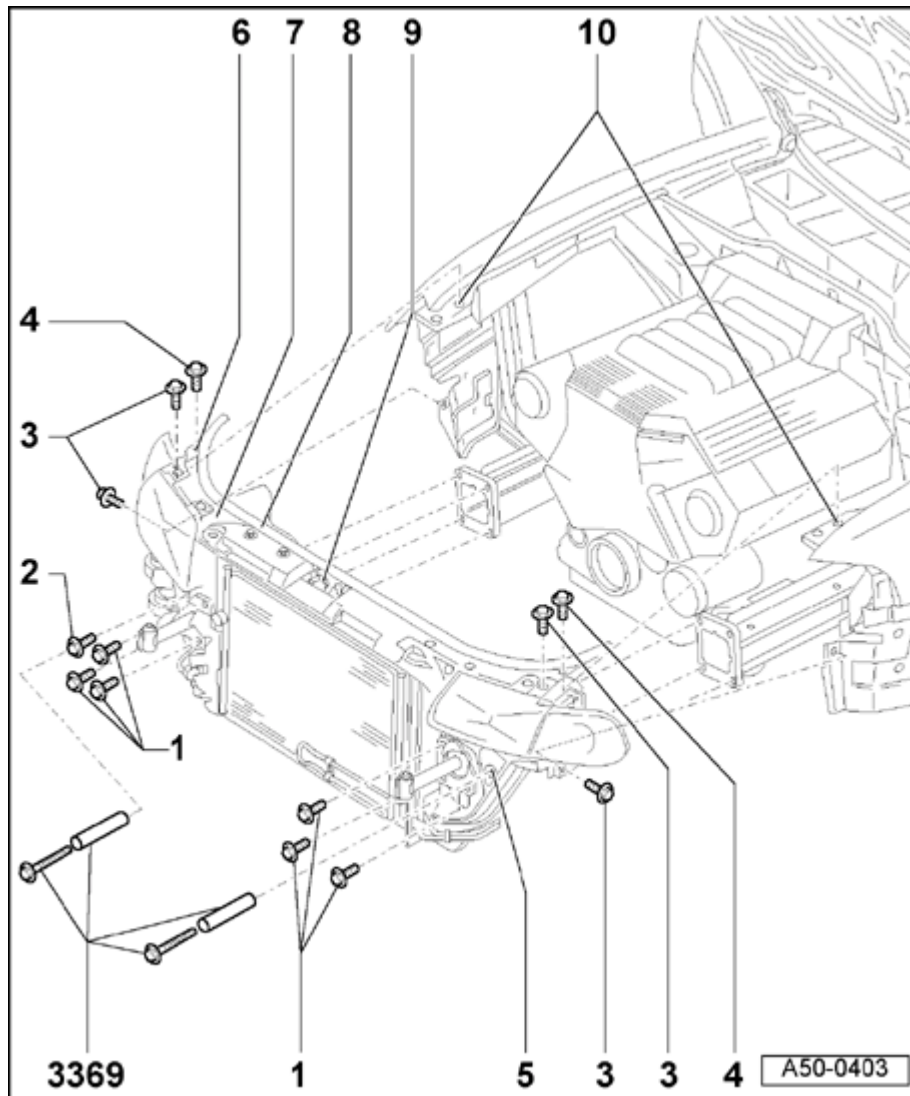
- Remove bumper ⇒ [page 63-1](#) .
- Remove noise insulation panel ⇒ [page 50-18](#) .
- Disconnect hood lock cable ⇒ [page 55-10](#) .
- Drain engine coolant and disconnect coolant hoses ⇒ [Fig. 2](#) .
- Disconnect condenser from lock carrier only (do not disconnect any lines) and secure with wire (e.g. at front wheel).

⇒ [Repair Manual, Heating & Air Conditioning, Repair Group 87](#)

Notes:

- ◆ Do not suspend condenser by its lines.
- ◆ Condenser lines must not be bent or kinked under any circumstances.
- Remove hydraulic oil cooler only (do not disconnect lines) ⇒ [Fig. 1](#) .

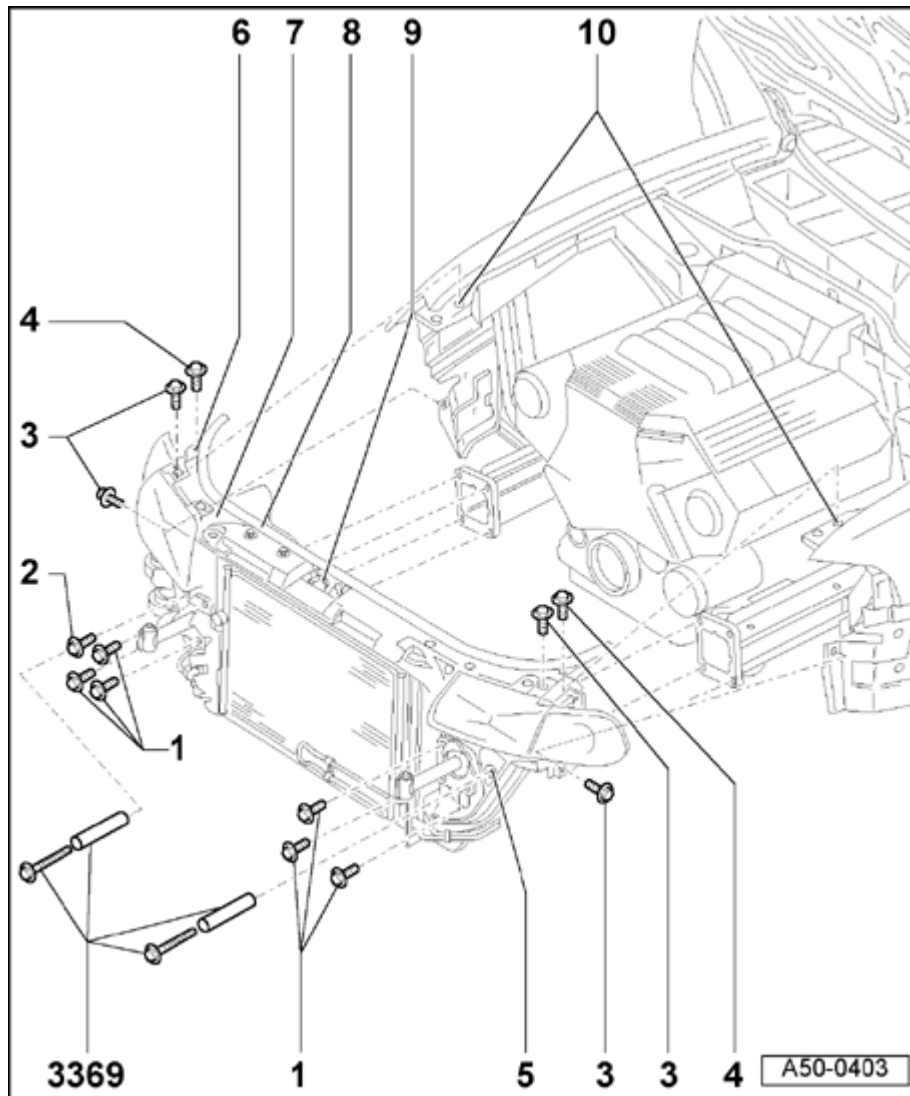
⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 48](#)

**Notes:**

- ◆ Do not suspend hydraulic fluid cooler by its lines.
- ◆ Hydraulic fluid cooler must not be bent or kinked under any circumstances
- ◆ On vehicles with automatic transmission, remove ATF cooler

⇒ *Repair Manual, Automatic Transmission, Repair Group 37*

- ◆ On vehicles with charge air cooler, remove intake air duct
 - Loosen seal for hood -8- at left and right where fender meets lock carrier -7-.
 - Remove bolts -3- and -4-.
- A second mechanic is needed to support lock carrier -7-
 - Remove bolts -1- and -2-.

**Installing:**

- Install in reverse order of removal.
- Adjust headlights.

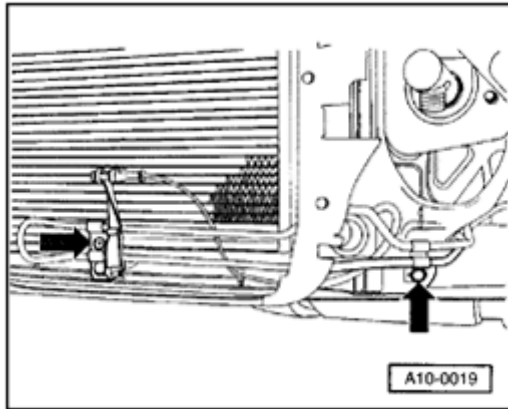
Adjusting:

- Center lock carrier -7- between fenders.
- If fenders and hood are also being replaced, center them in relation to one another before adjusting lock carrier.

8 - Hood seal**9 - Hood lock cable**

◆ Disconnecting ⇒ [page 55-10](#)

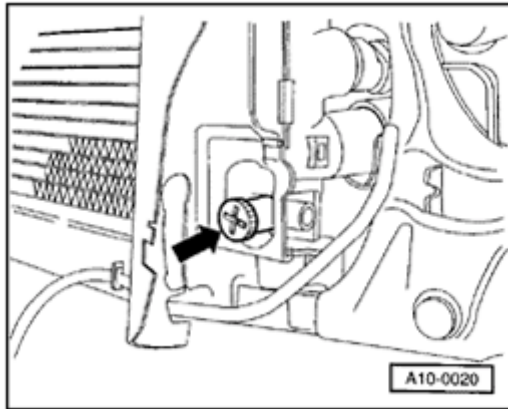
10 - Hole in side panel



A

Fig. 1 Disconnecting hydraulic fluid cooler

- Remove screws for cooling line (for power steering) at engine support and transmission.

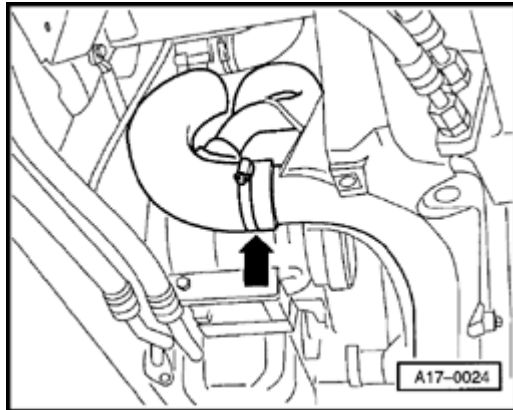


A

Fig. 2 Disconnecting coolant hose

- Drain coolant from radiator.
- Pull out locking element for coolant line connecting flange at bottom of radiator and remove connecting flange.
- Bleed coolant system.

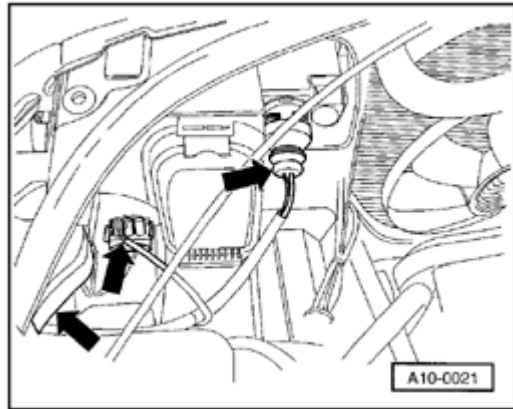
⇒ *Repair Manual, General, Engine, Repair Group 19*



A

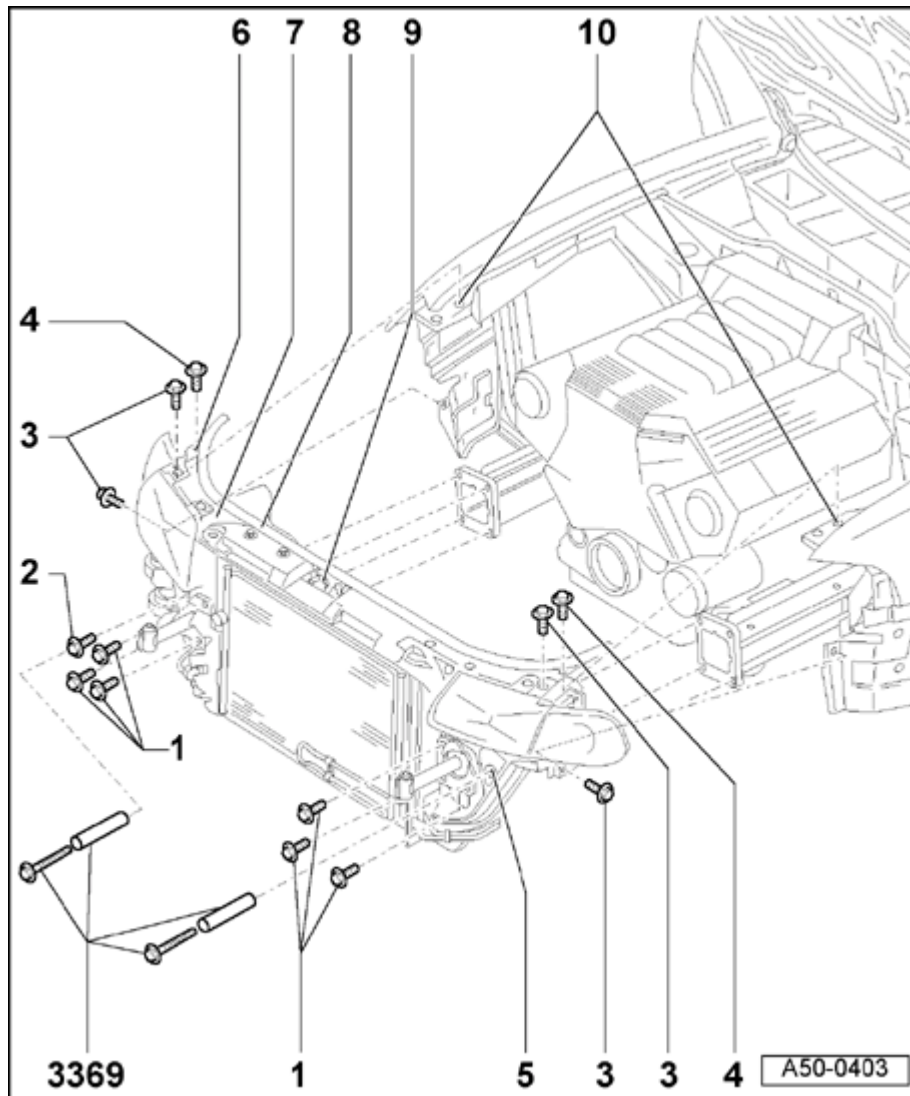
Fig. 3 Disconnect hose for charge air cooler

- On vehicles with charge air cooler, loosen bolt on hose clamp (arrow).
- Remove hose.
- Unscrew air duct to air cleaner at cowl and lift out.



A

- Disconnect harness connectors for headlights, headlight height adjustment and blinkers.
- Disconnect harness connector for coolant system temperature sensor for coolant fan at lower coolant hose area at radiator (left).



Lock carrier service position

Notes:

◆ Do not remove noise insulation. Loosen only front quick-release screws ⇒ [page 50-18](#).

◆ Bumper removed

1 - Combination bolt

◆ 45 Nm (33 ft lb)

2 - Combination bolt

◆ 45 Nm (33 ft lb)

3 - Combination bolt

◆ 10 Nm (7 ft lb)

4 - Combination bolt

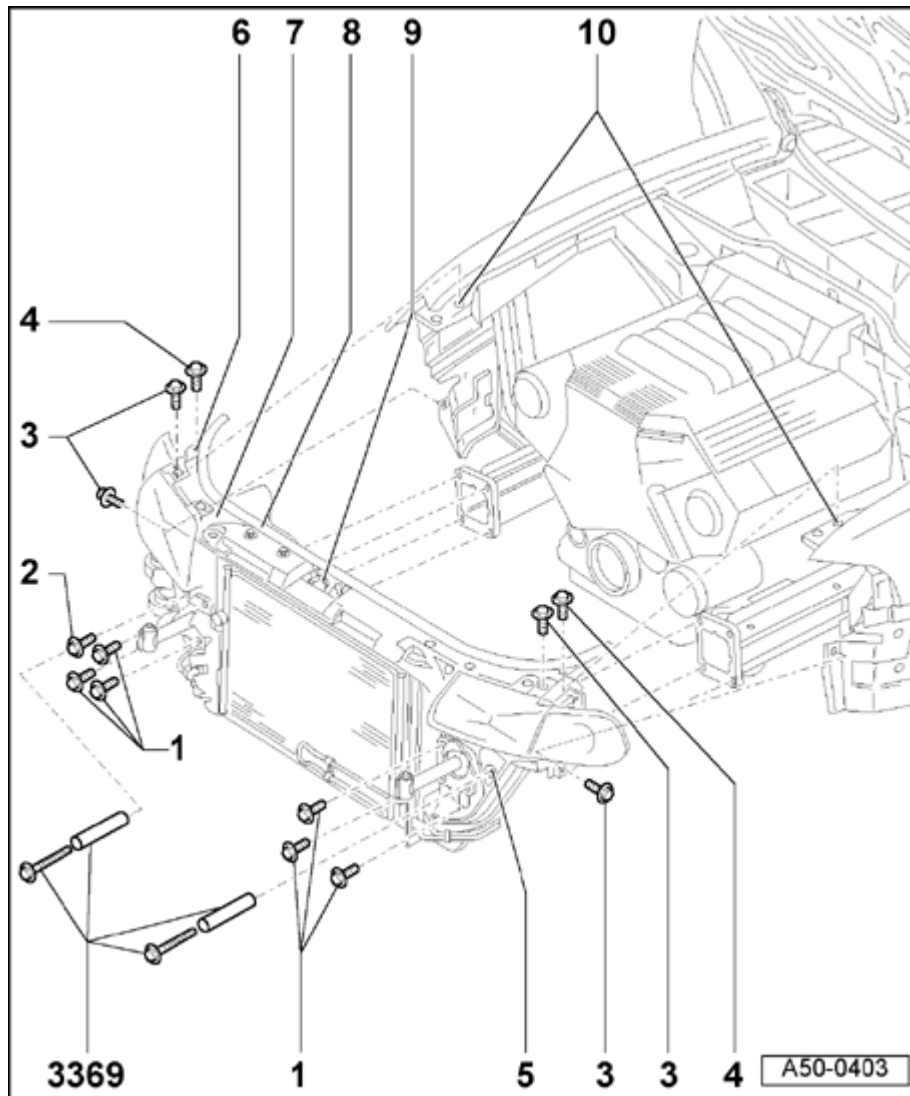
◆ 10 Nm (7 ft lb)

5 - Access hole for special tool

◆ For service position, attach special tool 3369 here

6 - Cowl attachment hole

◆ Attachment for service position



7 - Lock carrier

◆ For service position

- Screw special tool 3369 into threaded bore -5- on left side ⇒ [Fig. 1](#)
- Remove left and right mounting screws -1-.
- Remove mounting bolts -3- and -4- and pull lock carrier -7- forward.
- Secure lock carrier ⇒ [Fig. 2](#).

8 - Hood seal

9 - Hood lock cable

10 - Hole in side panel

Note:

After assembly of the lock carrier, check headlight positioning and adjust if necessary.

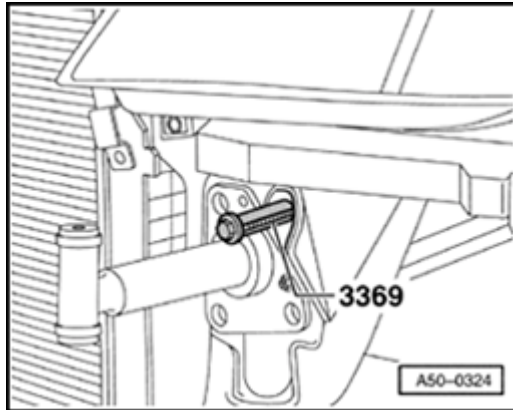


Fig. 1 Screw in special tool 3369

- Screw special tool 3369 in at left and right as shown.
- Pull lock carrier forward until rear hole in lock carrier aligns with front threaded hole in fender flange.

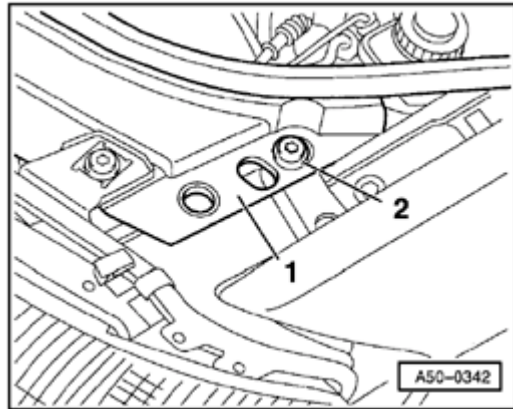
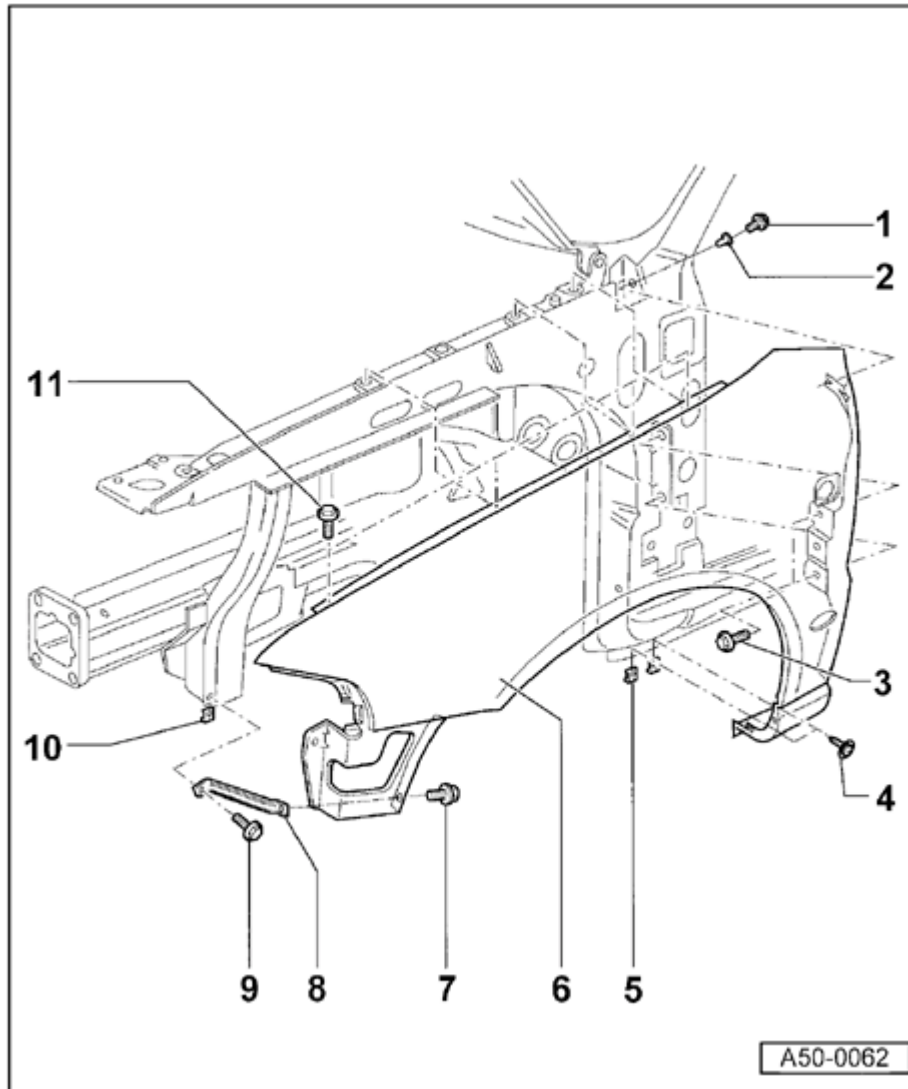


Fig. 2 Secure lock carrier

- Secure lock carrier with screws at left and right as shown.



Front fender (➤ VIN 8D XA 200 000), assembly overview

1 - Combination bolt

- ◆ 4.5 Nm (40 in. lb)

2 - Threaded rivet

- ◆ Threaded rivet is inserted using VAG1618A

3 - Combination bolts (2x)

- ◆ 7.5 Nm (66 in. lb)

4 - Phillips head screw

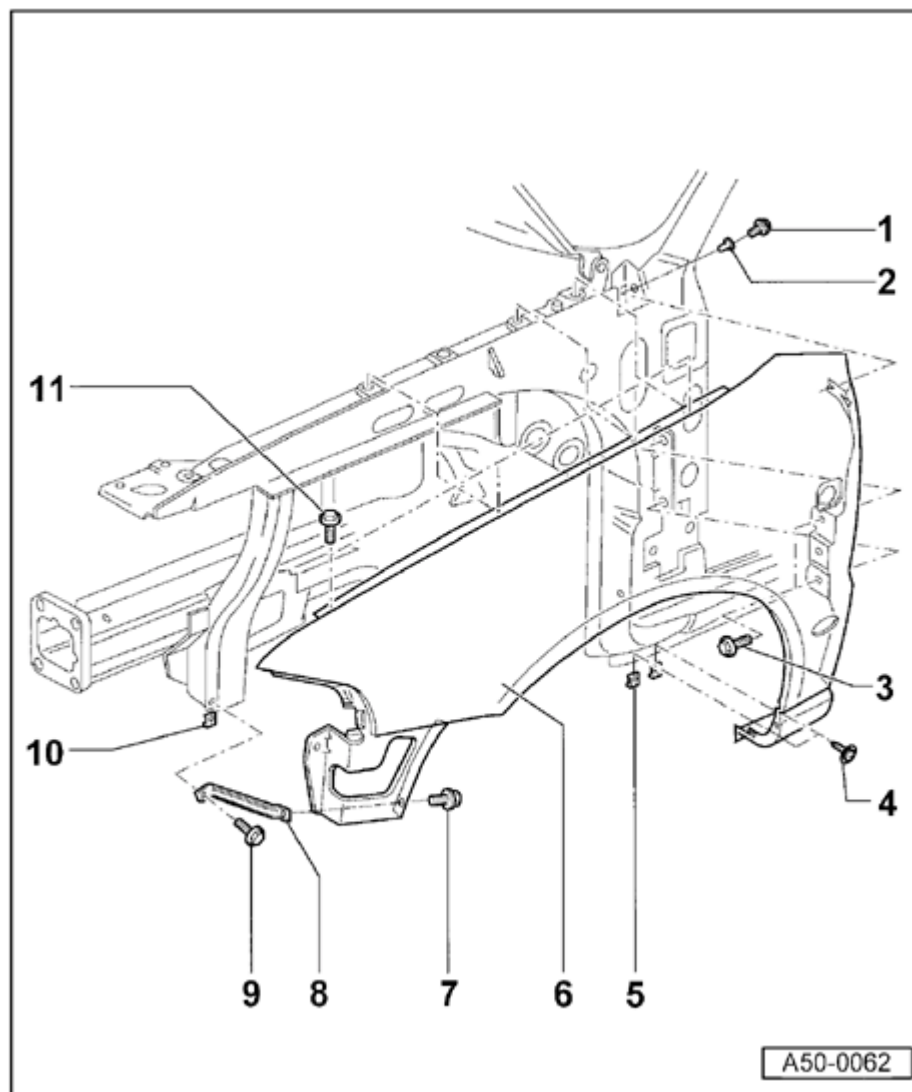
- ◆ 4.5 Nm (40 in. lb)

5 - Metal nut (2x)

6 - Fender

- ◆ Remove bumper ⇒ [page 63-1](#) .
- ◆ Remove wheelhousing liner ⇒ [page 66-31](#) .
- ◆ Remove end plate ⇒ [Fig. 1](#) .
- ◆ Remove headlights ⇒ Repair Manual, Electrical Equipment
- ◆ Disconnect electrical connectors for side blinkers
 - Remove bolts -1-, -3-, -4-, -7-, and -11-.

50-11

**7 - Combination bolt**

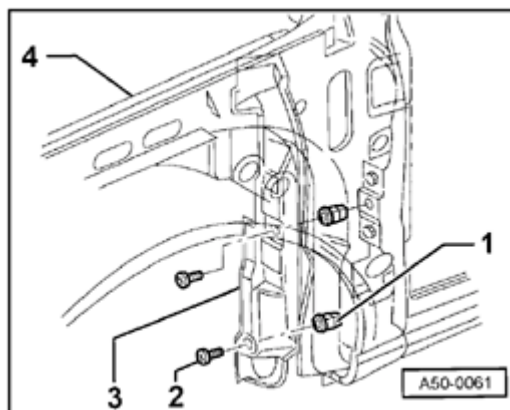
◆ 7.5 Nm (66 in. lb)

8 - Bracket**9 - Combination bolt**

◆ 7.5 Nm (66 in. lb)

10 - Metal nut**11 - Combination bolt**

◆ 7.5 Nm (66 in. lb)

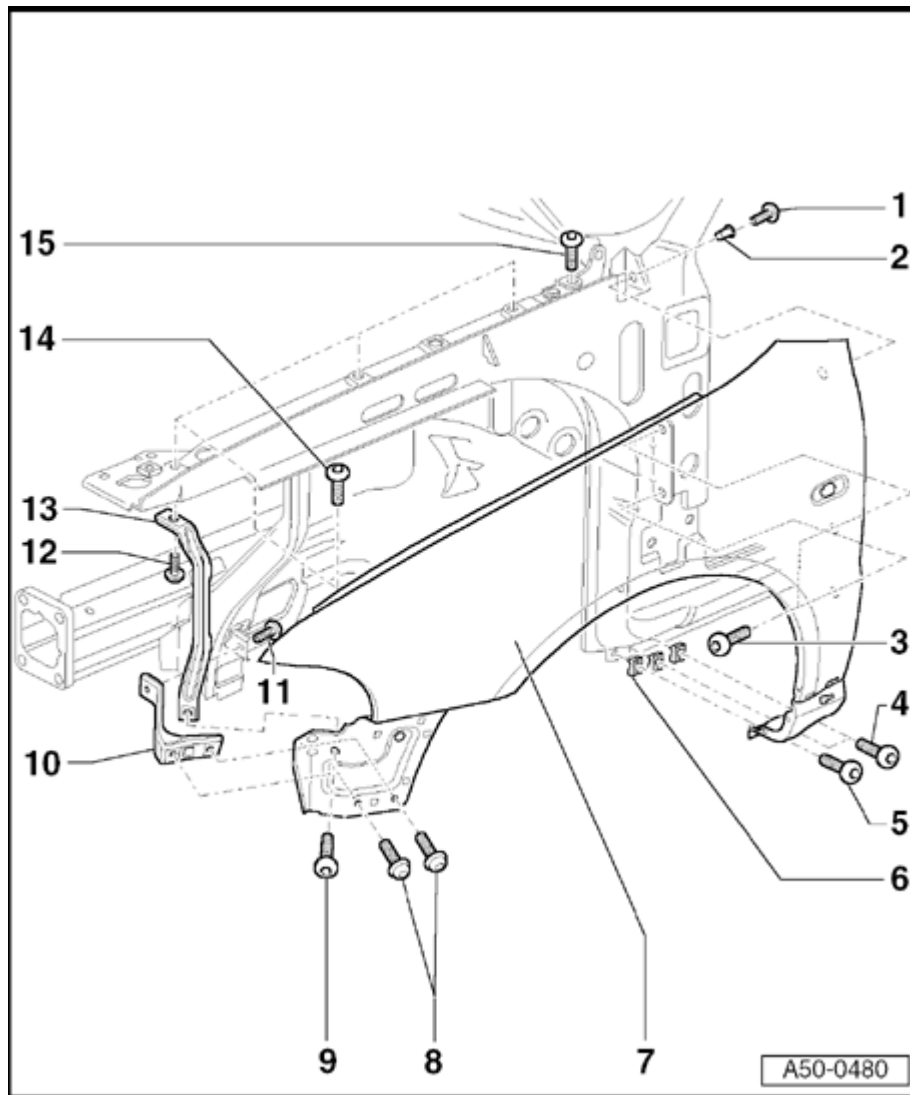


A

Fig. 1 Removing and installing end plate

- Remove front wheel.
- Remove wheelhousing liner ⇒ [page 66-31](#) .
- Remove bolt -2- (2x).
Tightening torque: 2.5 Nm (22 in. lb)
- Remove endplate -3- from fender -4-.

1 - Expanding clip (2x)



Front fender (VIN 8D XA 200 001 ➤ and S4), assembly overview

1 - Combination bolt

◆ 4.5 Nm

2 - Threaded rivet

◆ The threaded rivet is inserted with VAG 1618 A.

3 - Combination bolts (2x)

◆ 7.5 Nm

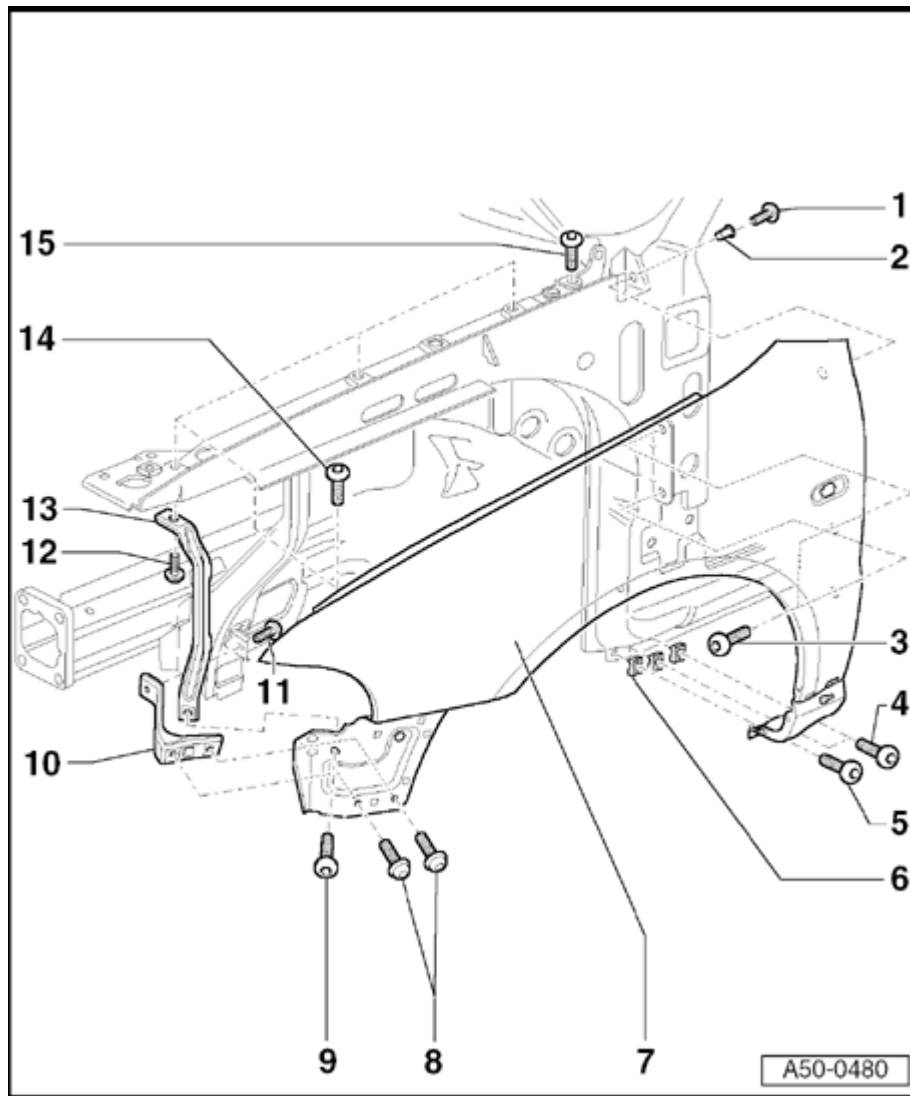
4 - Phillips-head screw

◆ 4.5 Nm

5 - Phillips-head screw

◆ Only installed for S4.

◆ 4.5 Nm



6 - Snap-on nut

- ◆ Only installed for S4.

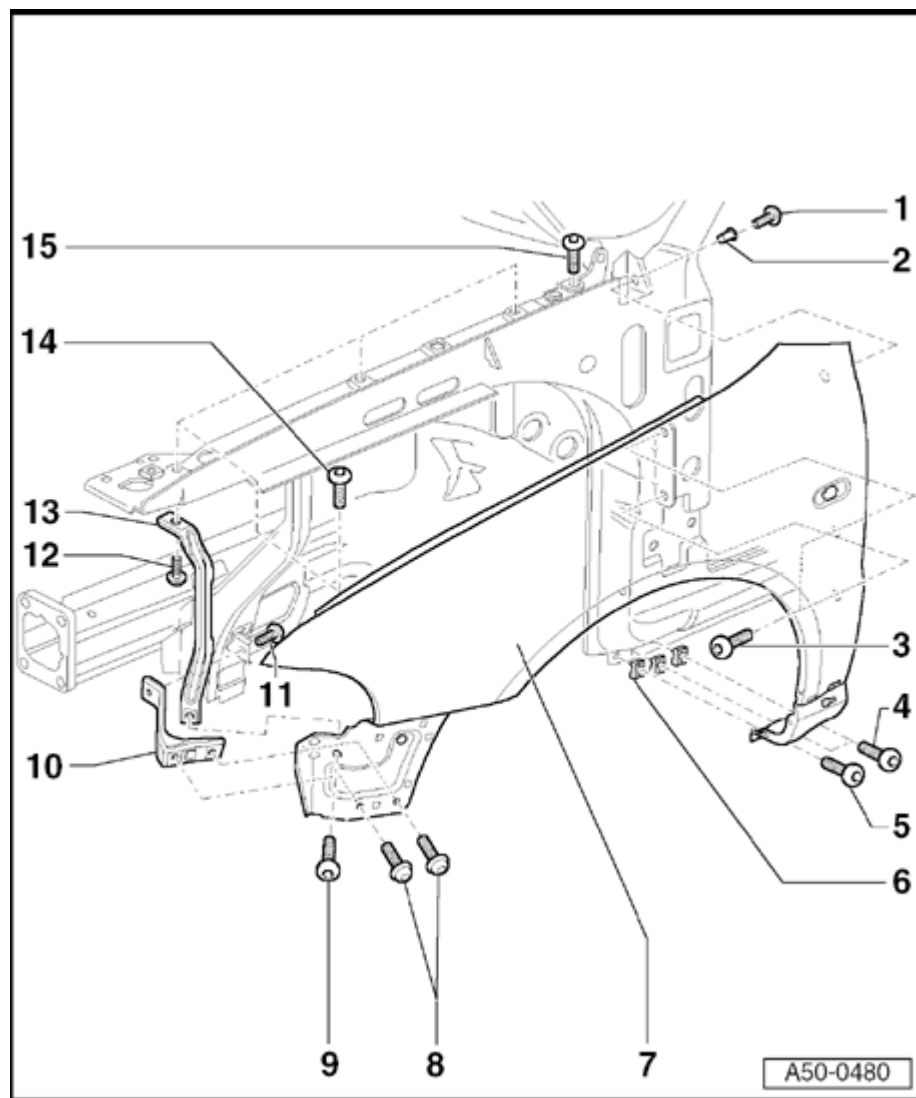
7 - Fender

- ◆ Drill additional hole at bottom for S4 fender
⇒ [Fig. 2](#).
- ◆ Removing:
 - Remove bumper ⇒ [page 63-5](#).
 - Remove wheelhousing liner ⇒ [page 66-31](#).
 - Remove headlights

⇒ [Repair Manual, Electrical Equipment, Repair Group 94, headlights, headlights, removing and installing.](#)

- Disconnect harness connector for side turn-signal.
- Remove end plate ⇒ [Fig. 1](#).
- Remove bolts -1-; -3-; -4- (bolt -5- only for S4) -8-; -9- and -14-.

50-15

**8 - Metal bolt**

◆ 7.5 Nm

9 - Metal bolt

◆ 7.5 Nm

10 - Bracket**11 - Metal bolt**

◆ 7.5 Nm

12 - Metal bolt

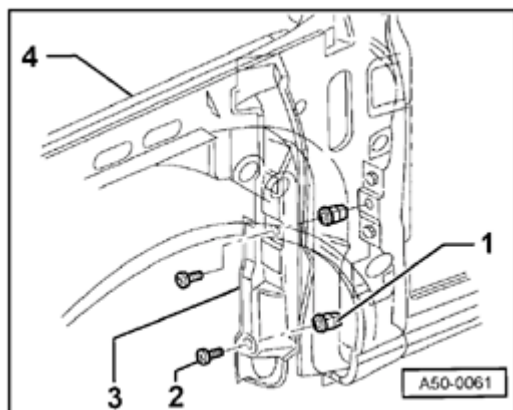
◆ 7.5 Nm

13 - Bracket**14 - Combination bolt**

◆ 10 Nm

15 - Combination bolt

◆ 7.5 Nm

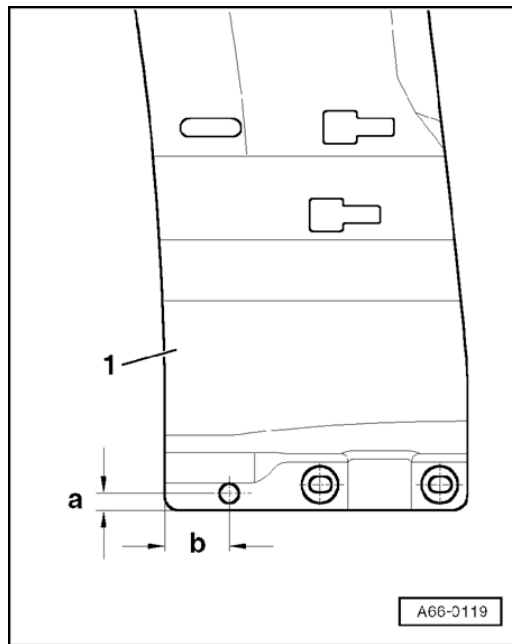


A

Fig. 1 Removing and installing end plate

- Remove front wheel.
- Remove wheelhousing liner ⇒ [page 66-31](#) .
- Remove bolt -2- (2x).
Tightening torque: 2.5 Nm
- Remove end plate -3- from fender -4-.
- Expanding clip -1- (2x).

50-17

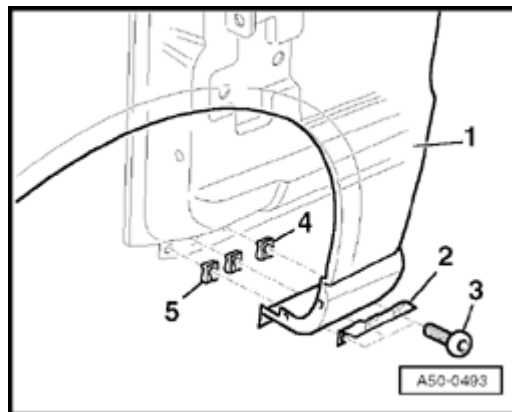


A

Fig. 2 Drilling hole for S4 fender**Note:**

For part replacement, drill hole before painting.

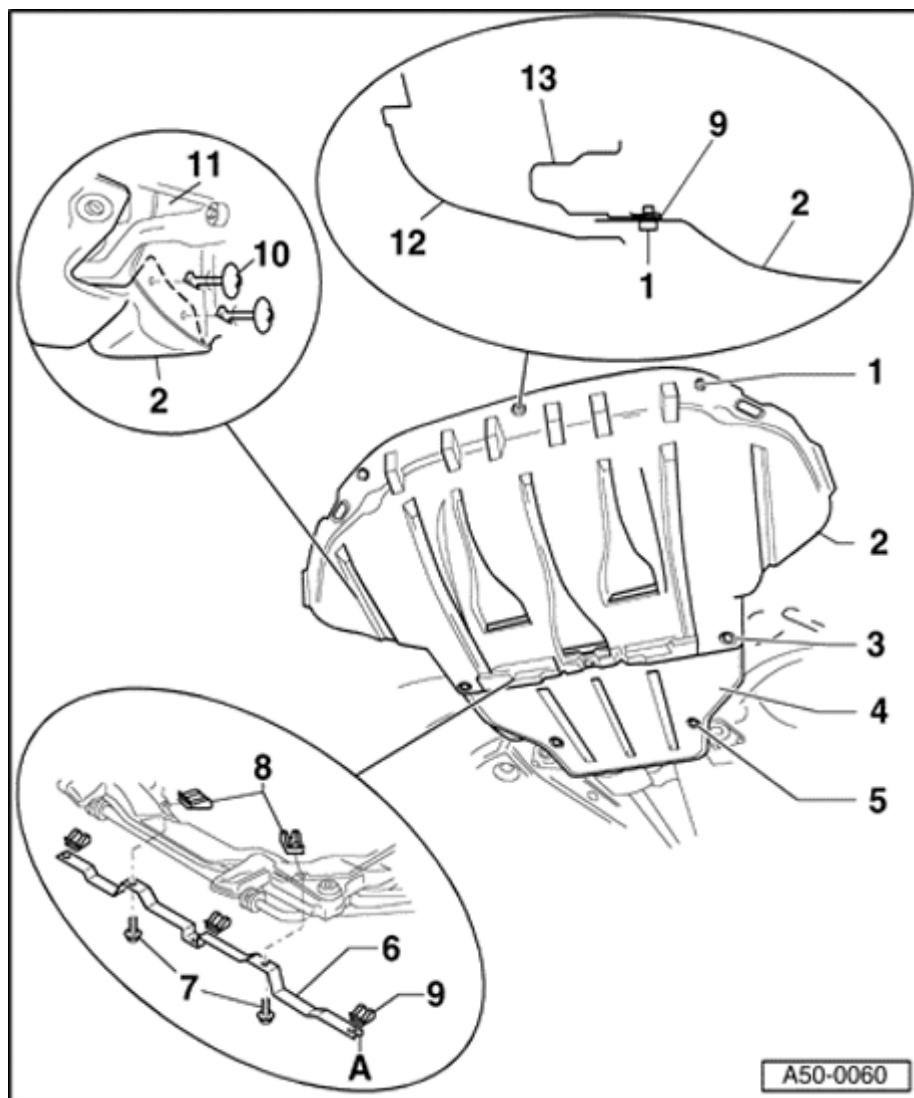
- Drill 7 mm diameter hole in fender. Dimension -a- = 22mm and -b- = 8mm.
- Restore corrosion protection at edges of hole.



A

Fig. 3 Lower fender mount (S4)

- Slide speed nuts -4- onto door sill from bottom.
- Speed nuts -5- only for S4
- Secure fender -1- at bottom using reinforcing bracket -2- and bolts -3-.



Noise insulation panel, assembly overview

1 - Quick-release screw

- ◆ Remove only this quick release screw for service position
- ◆ Three pieces
- ◆ 2 Nm (18 in. lb)

2 - Front noise insulation

3 - Quick release screw

- ◆ Three pieces
- ◆ If rear noise insulation panel is also - 4 - being installed, then longer quick-release screws must be used
- ◆ 2 Nm (18 in. lb)

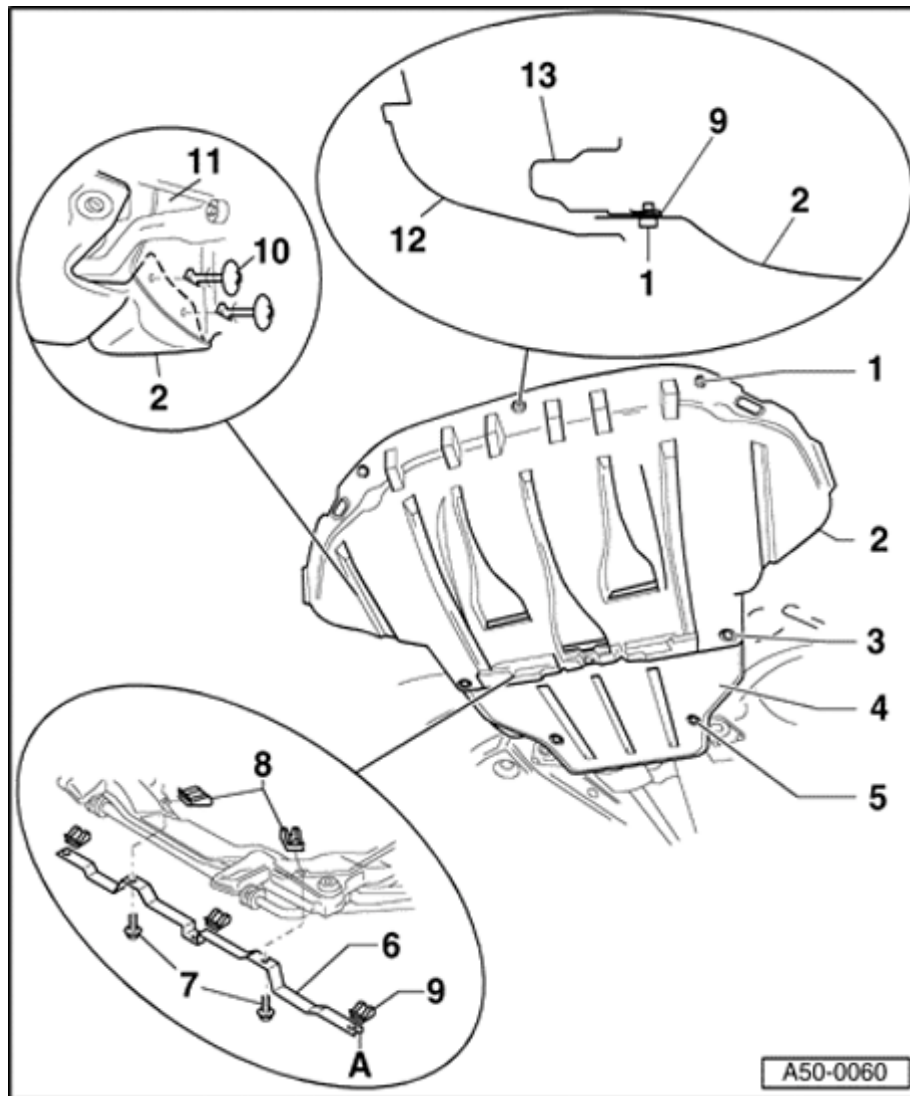
4 - Rear noise insulation panel

- ◆ Only installed for certain engine types
- ◆ Installed over noise insulation panel -2-

5 - Quick-release screw

- ◆ Two pieces
- ◆ 2 Nm (18 in. lb)

50-19

**6 - Mounting for noise insulation panel**

- ◆ Position -9- must face left side of vehicle

7 - Bolt

- ◆ Two pieces
- ◆ 7.5 Nm (66 in. lb)

8 - Plate nut

- ◆ Two pieces

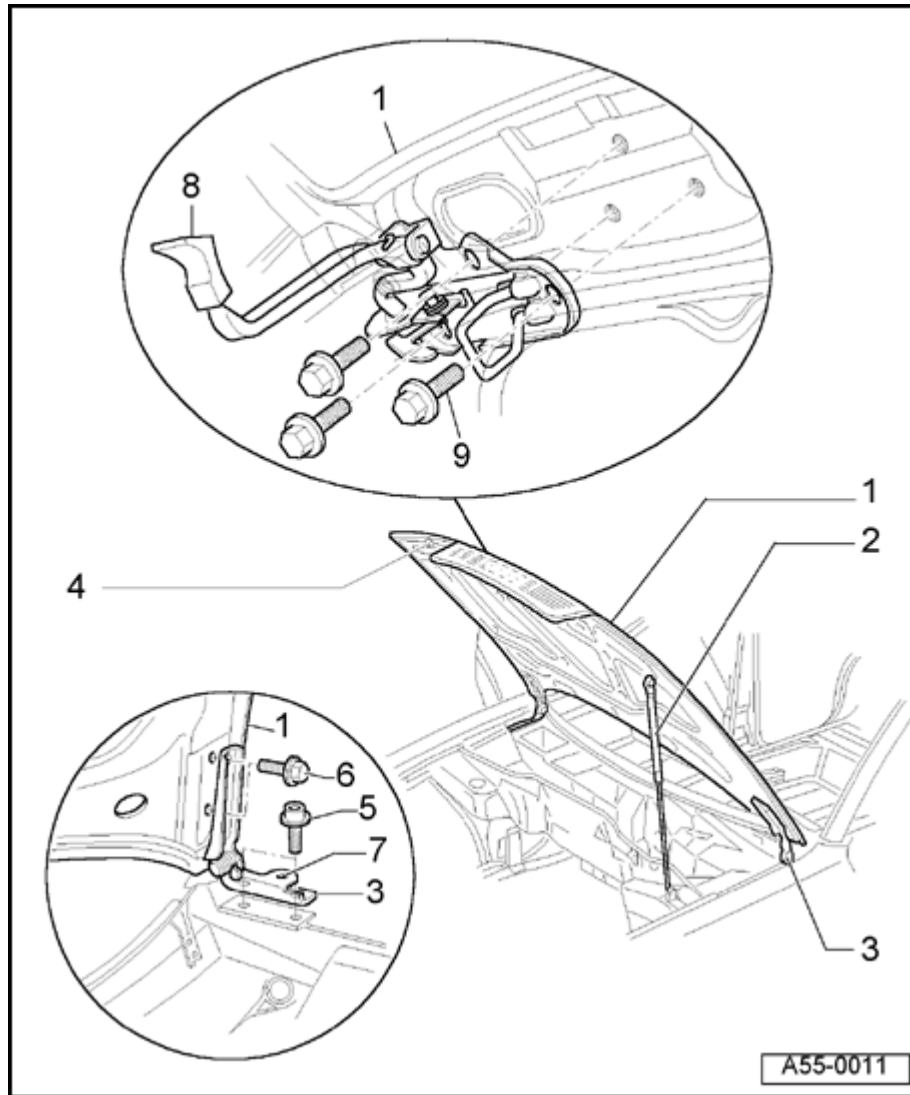
9 - Plate nut

- ◆ Three pieces

10 - Clamping pin

- ◆ Two pieces

11 - Wheelhousing liner**12 - Bumper****13 - Lock carrier with attachments**



Hood

Hood, removing, installing and adjusting

1 - Hood

Removing:

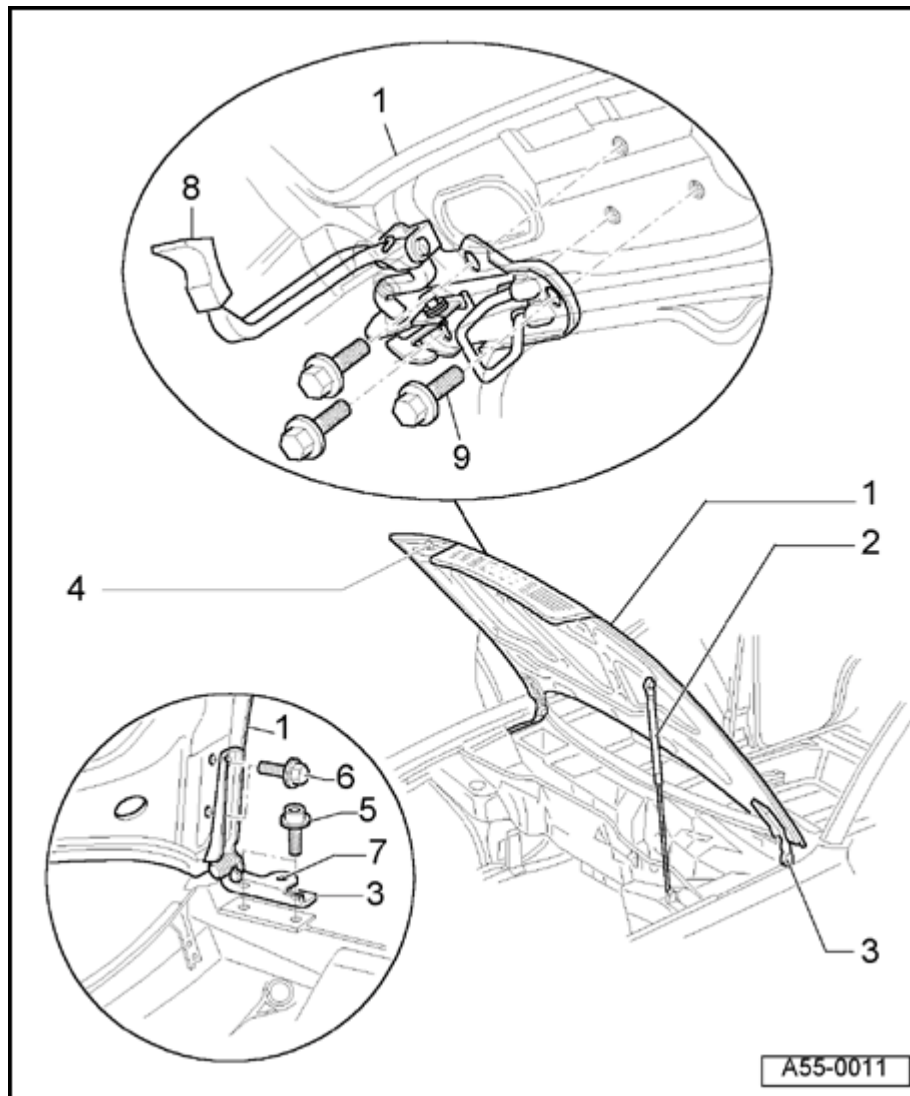
- Disconnect hose to windshield washer system and unclip.
- Second person is needed to support and lift hood during removal
 - Disconnect gas-filled strut -2- from hood -1-.
 - Remove bolts -6-.
 - Remove hood.

Installing:

- Install in reverse order of removal.

Adjusting:

- Align hood -1- between fenders.
- Adjust height of hood at hood lock ⇒ [Fig. 4](#) ⇒ [Page 55-7](#).
- ◆ Hood can be adjusted for height relative to fenders by adjusting stop buffers -4- ⇒ [Fig. 2](#) ⇒ [Page 55-6](#)
- ◆ Panel gap dimensions ⇒ [Fig. 5](#) ⇒ [Page 55-7](#)



2 - Gas-filled strut

- ◆ Removing ⇒ [page 55-4](#)
 - To install, press gas-filled strut onto ball stud.
 - Install with tube end of strut at body of vehicle.
- ◆ Releasing pressure ⇒ [page 55-5](#)

3 - Hood hinge

- ◆ Hood -1- must be removed or propped up securely
 - To remove, remove bolts -5-, -6- and -7-.

4 - Stop buffer

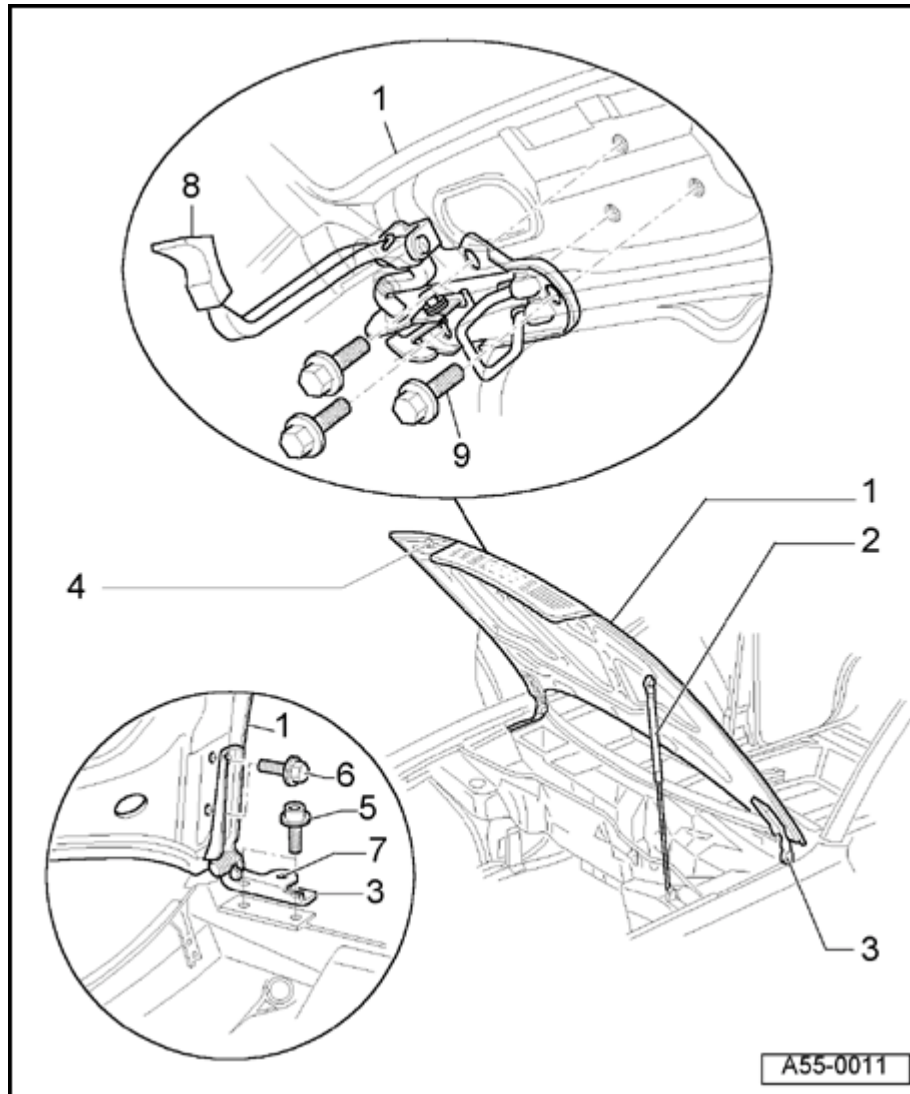
- ◆ Adjusting ⇒ [Fig. 2](#) ⇒ [Page 55-6](#)

5 - Bolts (2x)

- ◆ 21 Nm (15 ft lb)

6 - Bolts (2x)

- ◆ 21 Nm (15 ft lb)

**7 - Bolt**

- ◆ 7.5 Nm (66 in. lb)

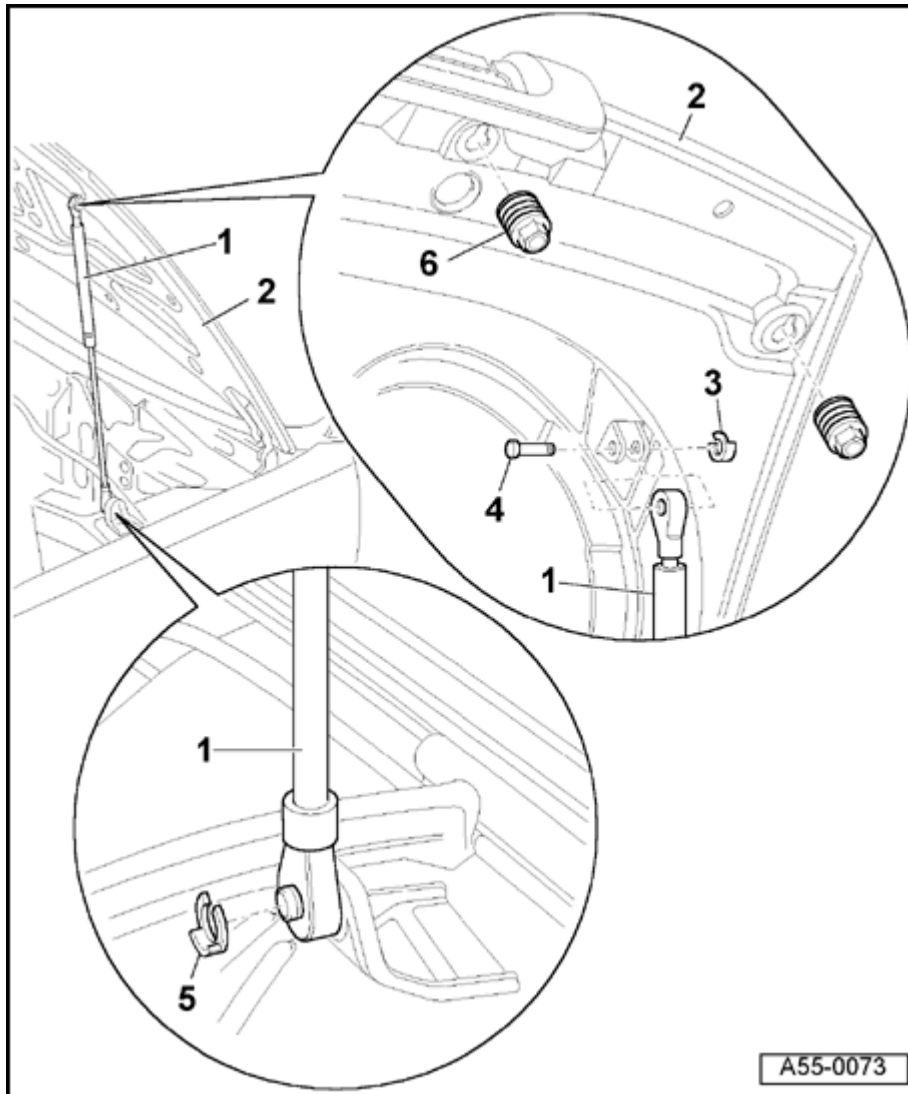
8 - Hood lock release

- To remove, remove bolt -9-.

- ◆ Installing ⇒ [Fig. 3](#) ⇒ [Page 55-6](#)
- ◆ Hood lock release can only be adjusted in direction of travel

9 - Bolts (3x)

- ◆ 8 Nm (71 in. lb)



Gas-filled strut, removing and installing

1 - Gas-filled strut

Removing:

- Prop up or secure hood -2- in open position.
- Remove securing clip -5-.
- Also remove clip -3-.
- Lift hood slightly, remove bolt -4- and remove gas-filled strut.

Installing:

- Install with tube end of strut at body of vehicle.

2 - Hood

3 - Securing clip

4 - Pins

5 - Securing clip

6 - Stop buffer

- ◆ Hood height adjustment ⇒ [Fig. 2](#)

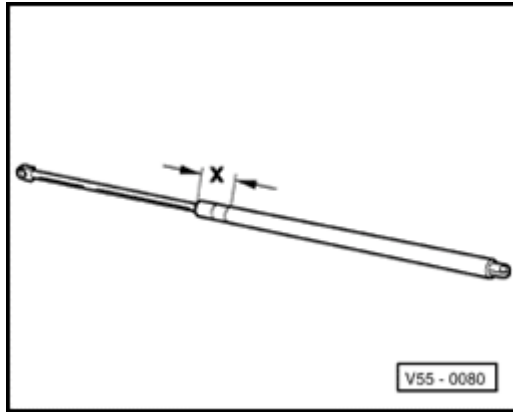


Fig. 1 Releasing gas from strut

- Clamp gas-filled strut in vice area -x-.

Dimension -x-: 50 mm (2 in.)

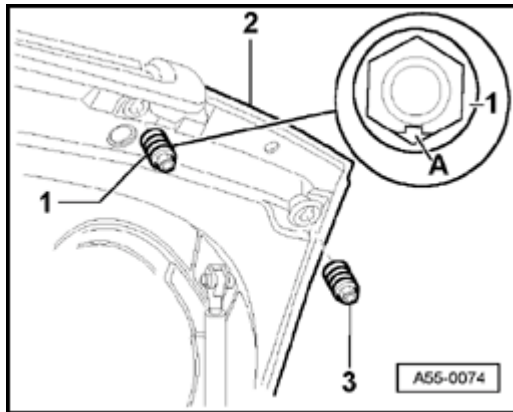
- Using saw, cut into cylindrical part of strut at point within first third of cylinder's length (measured from piston rod end of cylinder).

WARNING!

Clamp only in the area shown; otherwise there is a risk of an accident!

Note:

Always wear eye protection when performing this procedure. Cover the sawing area with a clean rag to contain any escaping fluid.



A

Fig. 2 Adjusting height of stop buffers

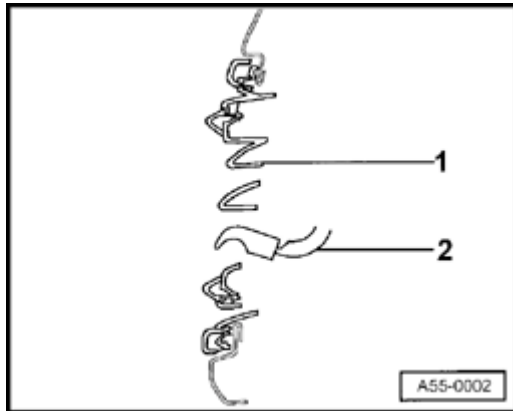
- When hood is closed, stop buffer -3- (2x external) must rest lightly on the lock carrier.

Note:

The stop buffers can be used for adjusting the height of the hood.

- Turn stop buffer -1- (2x internal) in hood -2- until impact, then unscrew one half rotation.

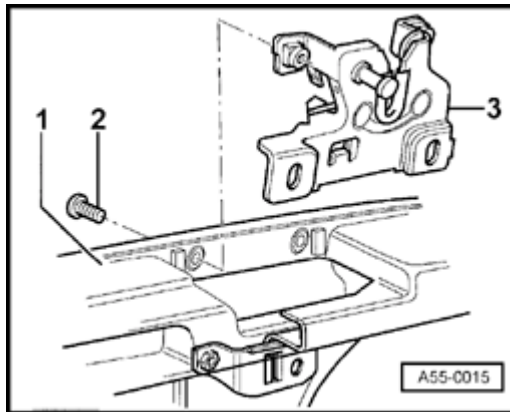
Marking -A- must point toward rear of vehicle.



A

Fig. 3 Hood latch release

- Hood lock actuator -2- must be flush with radiator grill when closed.
- Hood lock actuator must be centrally positioned relative to radiator grill.



A

Fig. 4 Removing and installing lower section of hood lock

- Disengage hood lock cable ⇒ [page 55-10](#) .

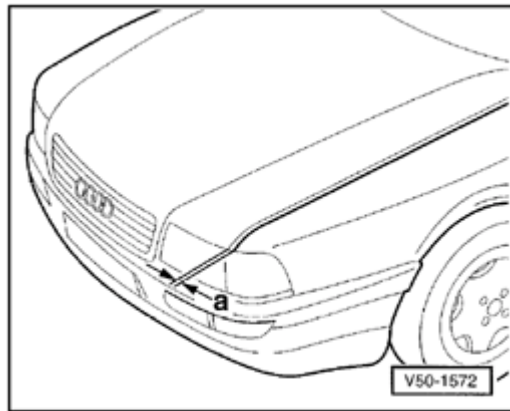
- Remove bolts -2- (4x).

Tightening torque: 10 Nm (7 ft lb)

- Remove lower section of lock -3-.

1 - Lock carrier

- To adjust hood, move lower section of lock up or down as required.



A

Fig. 5 Panel gap dimensions

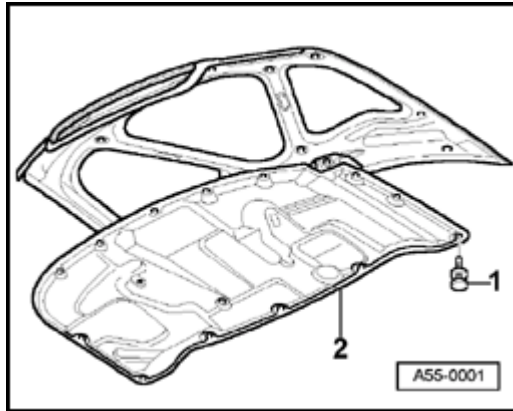
Gap dimensions can be checked using 3371 adjustment gauge.

Dimension -a- = 3.0 mm

Hood lining, removing



- Remove clips -1- (17x).
- Remove lining -2-.

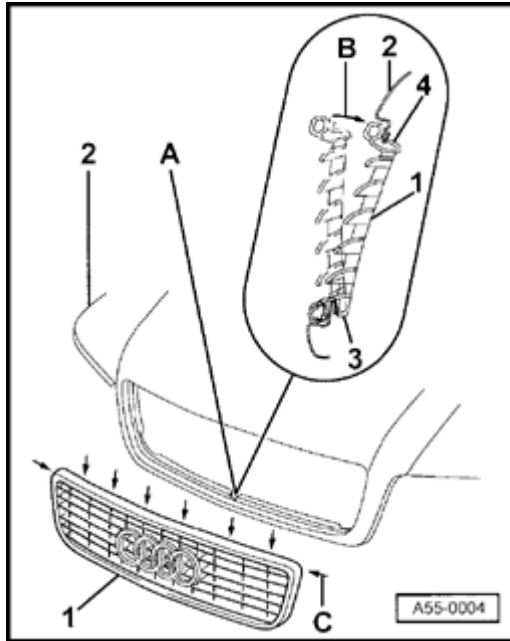


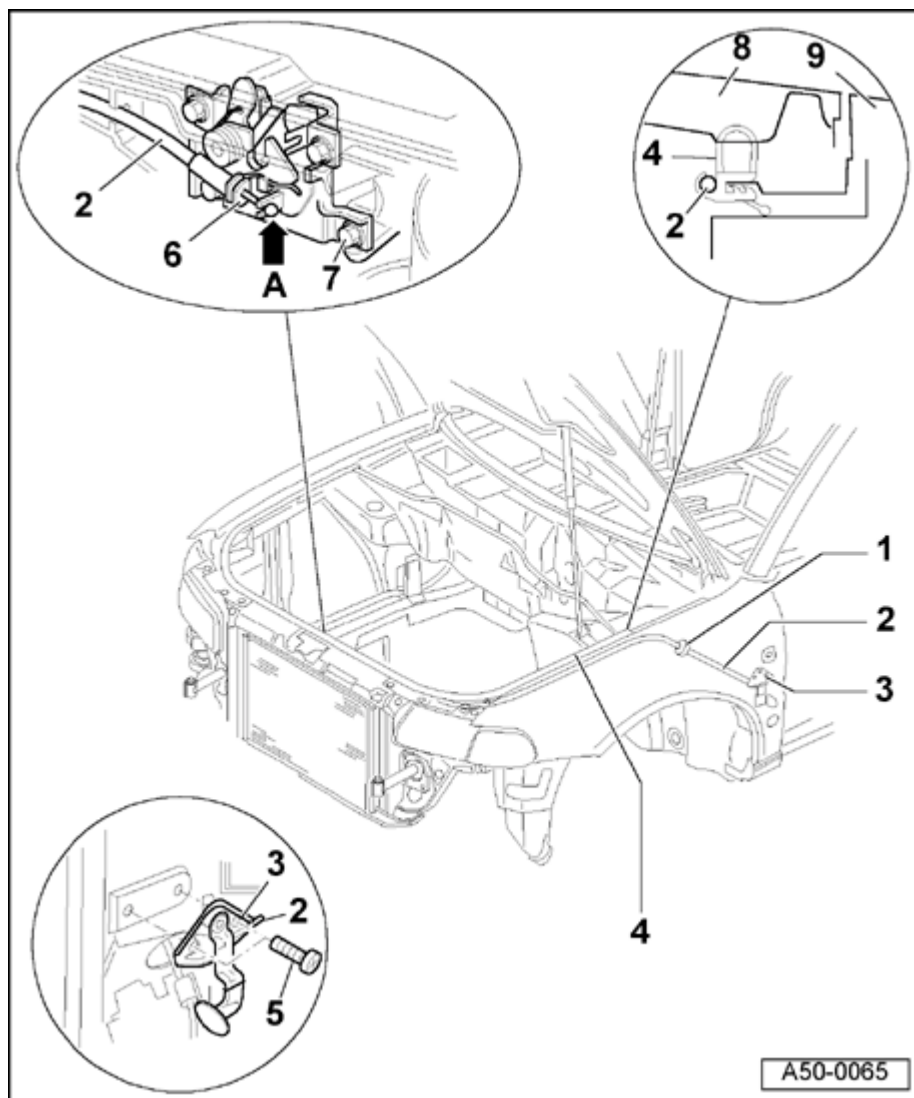
Radiator grill, removing and installing



Mounting point -A- centers radiator grill in hood.

- Place radiator grill -1- in guide notch -3- and clip into hood -2- in direction shown by arrow -B-.
- Arrows -C- designate all retaining tabs -4-. Retaining tabs must be unclipped individually during grill removal.





Hood lock cable, removing and installing

1 - Grommet

2 - Hood lock cable

Removing:

- Remove storage compartment on driver's side.

⇒ [Repair Manual, Body-Interior, Repair Group 68](#)

- Remove bolts -3-.
- Detach cable -2- at support -6- and disengage from attachment point -A-.
- Remove cable -2- from guide channel in seal -4- and pull cable through bulkhead into interior of vehicle.

Installing:

- Install in reverse order of removal.

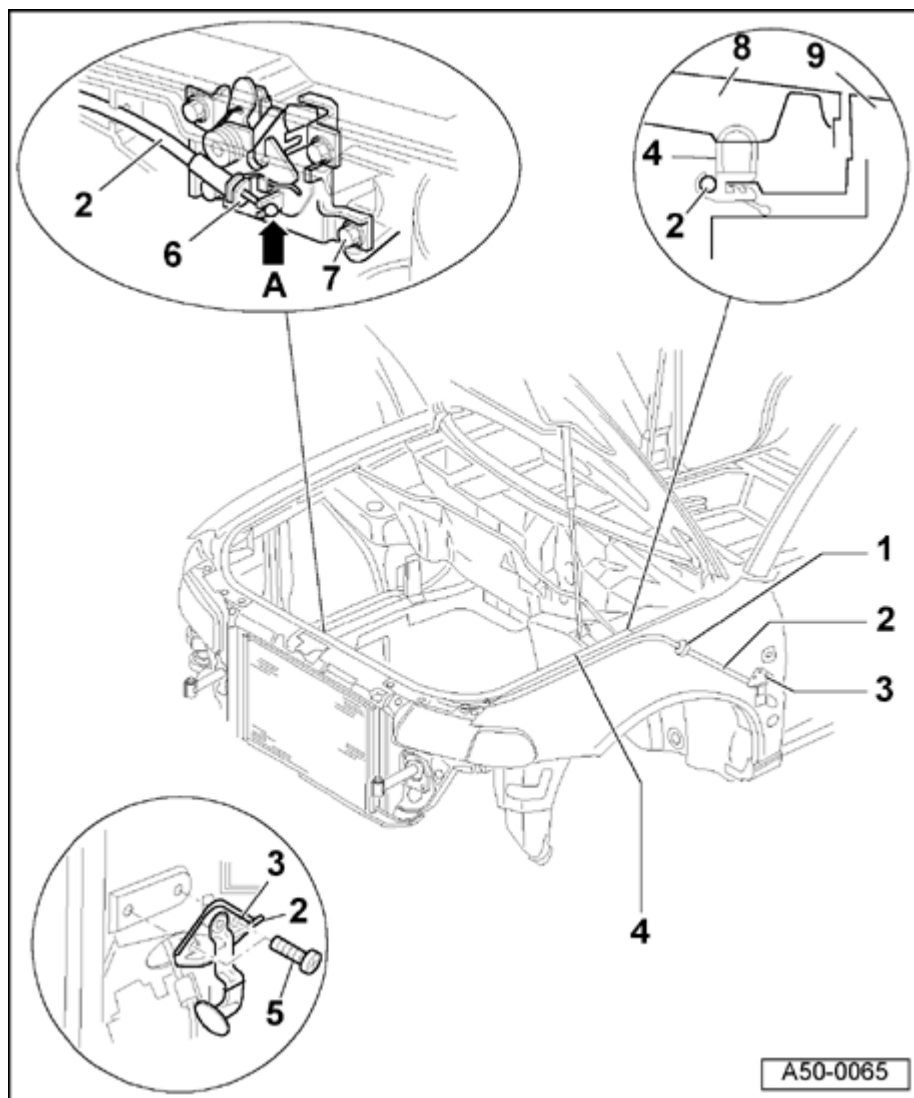
3 - Hood lock release

4 - Seal

5 - Bolt

- ◆ Qty: 2
- ◆ 4 Nm (35 in. lb)

55-11

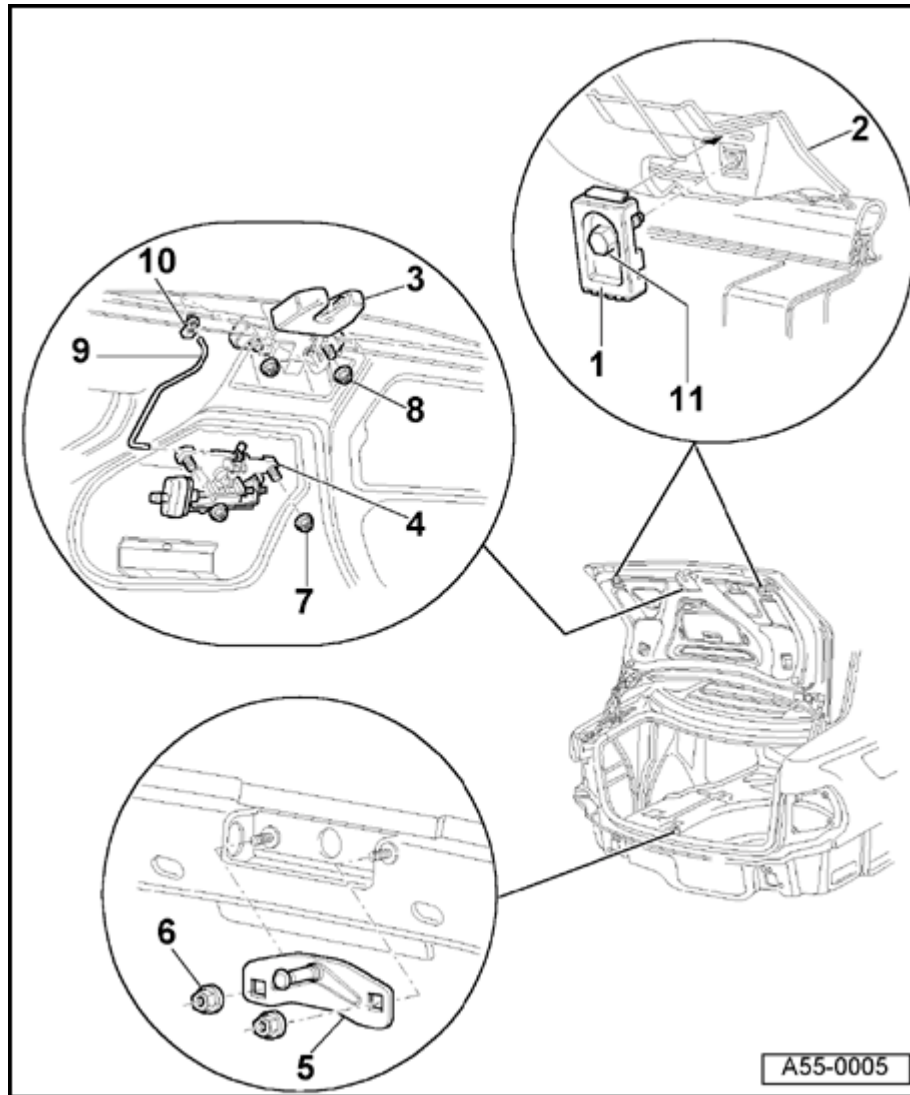
**6 - Attachment point for hood lock cable****7 - Bolt**

◆ Qty: 4

◆ 10 Nm (7 ft lb)

8 - Hood

55-12



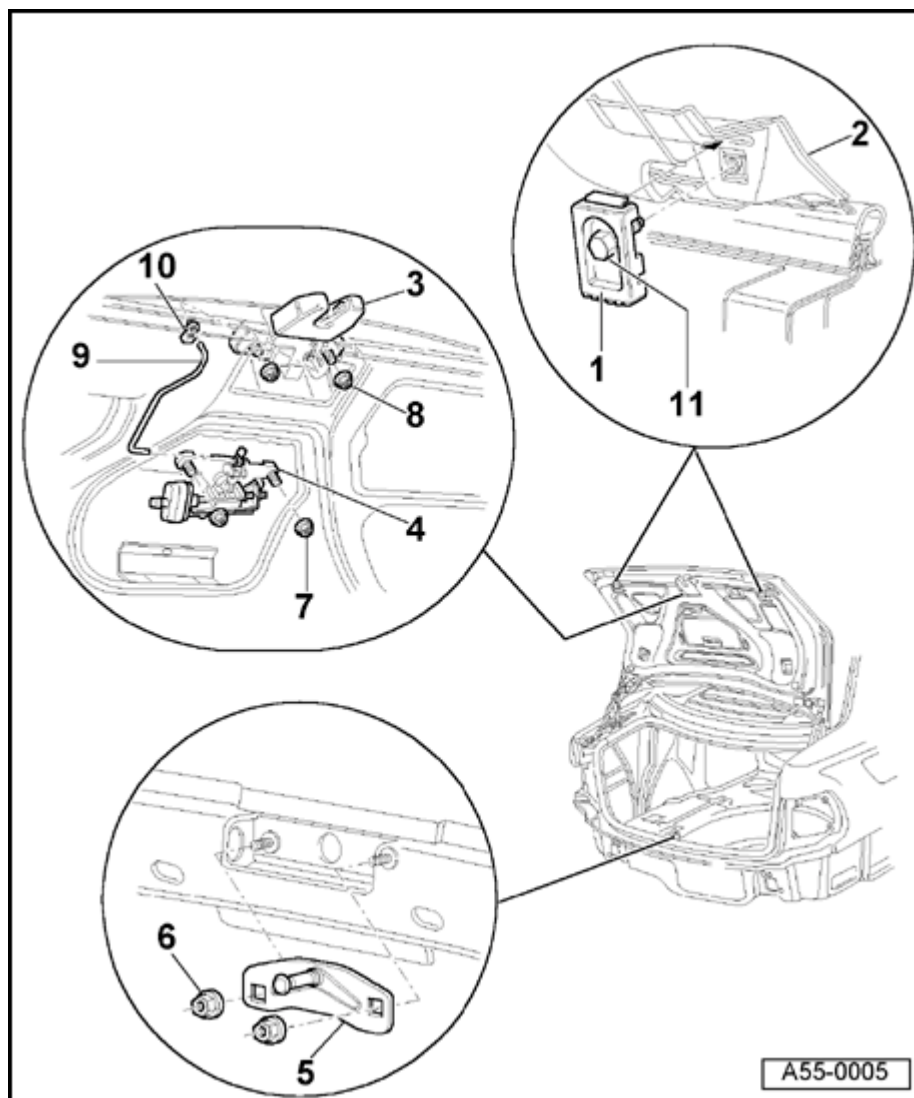
Rear lid (➤ m.y. 1999 VIN 8D XA 200 000)

Rear lid and rear lid lock, removing, installing and adjusting

1 - Stop buffer (2x)

Adjusting:

- Loosen bolt -11- and detach stop buffer.
- Tighten bolt -11- finger-tight (it must still be possible to move stop buffer).
- Carefully close rear lid until lid is flush with rear side panels.
- Carefully open rear lid -3-.
- Pull stop buffer -1- out two catches (1 mm preload) and tighten bolt -2- to 6 Nm $\pm$ 0.5 Nm (53 in. lb $\pm$ 4 in. lb).



2 - Rear lid

Removing:

- Remove warning triangle and holder ⇒ [page 55-21](#) .
- Remove rear lid lining.
- Disconnect and unclip electrical wiring harness connectors.
- Unclip vacuum line for central locking system.
- Second person is needed to remove lid
 - Remove nuts for rear lid hinges ⇒ [page 55-16](#) .

Installing:

- Install in reverse order of removal.

Adjusting:

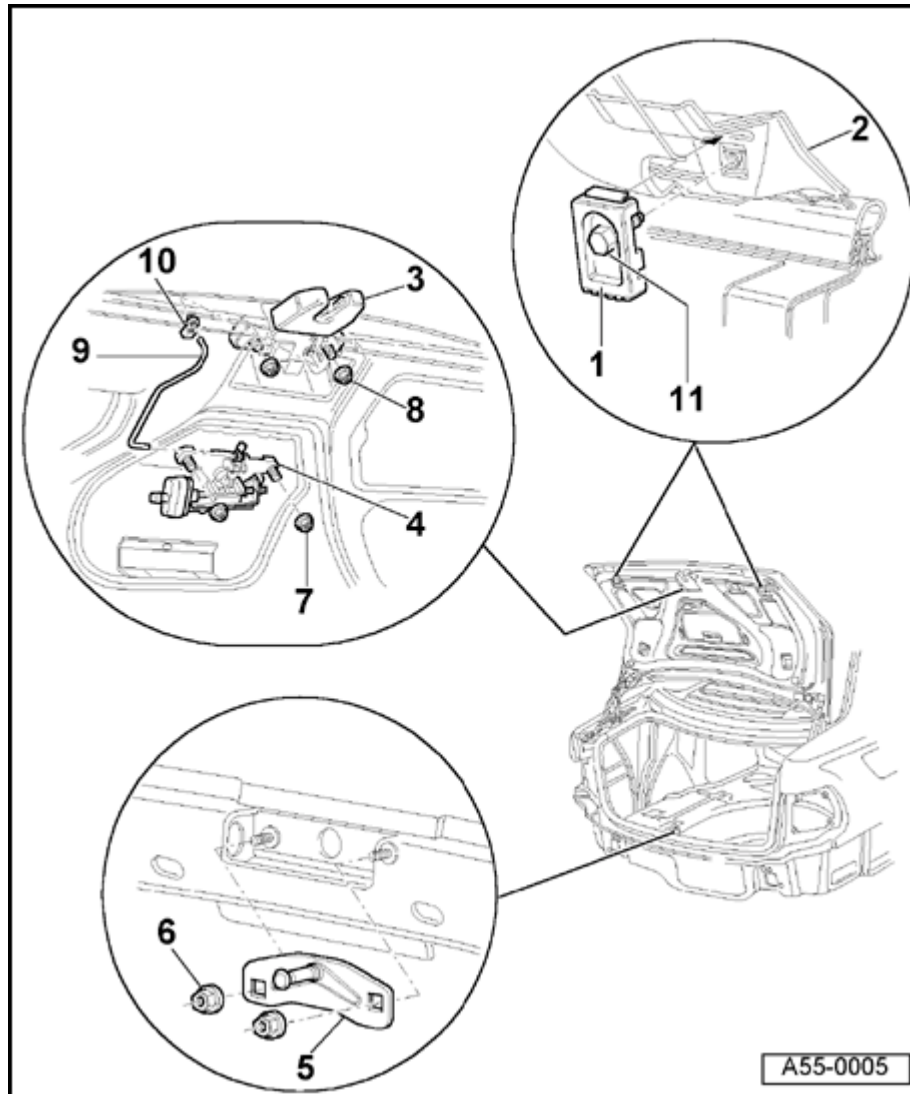
- Use rear lid hinges to center and adjust height of rear lid ⇒ [page 55-17](#) .
- Adjust stop buffers -1-.
- Adjust striker plate -5-.
- Center lid according to panel gap dimensions ⇒ [page 55-20](#) .

3 - Rear lid lock

- Unclip operating rod -9-.

- Unscrew nuts -8-.

55-14



4 - Locking cylinder

- Remove warning triangle and holder ⇒ [page 55-21](#) .
- Remove rear lid lining.
- Disconnect vacuum line for central locking system.
- Disconnect harness connectors.
- Unclip operating rod -9-.
- Remove bolts -7-.

5 - Striker plate

- Unscrew nuts -6-.

Adjusting:

- Tighten nuts -6- finger-tight (it must still be possible to move striker plate).
- Carefully close rear lid until lid is flush with rear side panels.
- Carefully open lid and tighten nuts -6-.

6 - Hex nut

- ◆ 8 Nm (71 in. lb)

7 - Hex nut

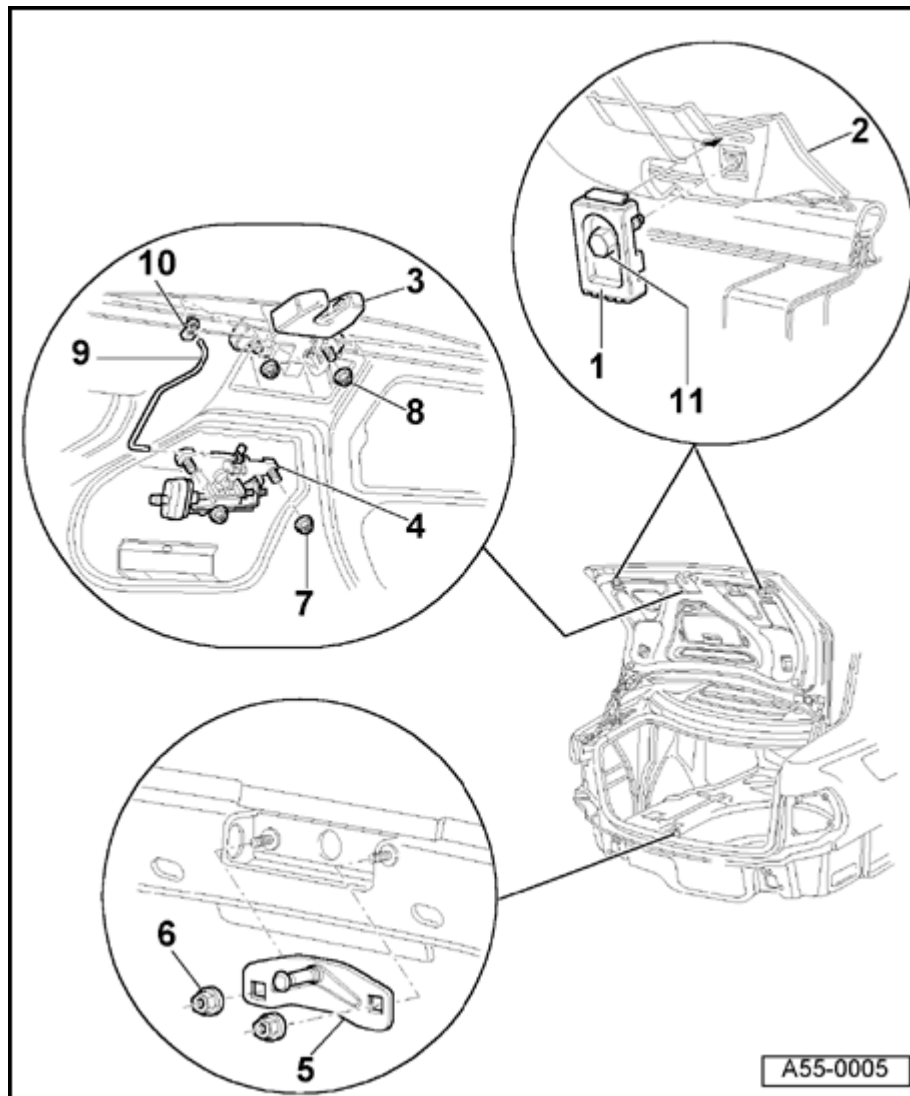
- ◆ 8 Nm (71 in. lb)

8 - Hex nut

◆ 6 Nm (53 in. lb)

9 - Operating rod

55-15

**10 - Retaining clip****11 - Hex bolt**

◆ 6 Nm (53 in. lb)

Rear lid hinge, removing and installing

Rear lid hinge cover

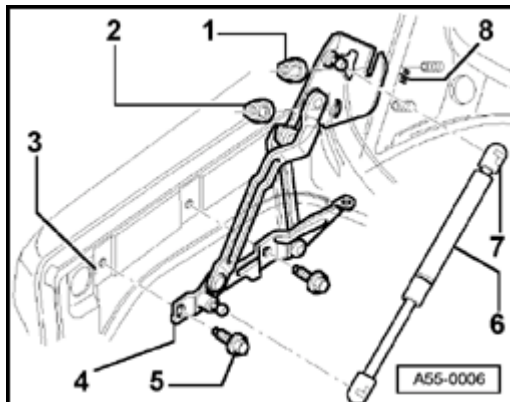
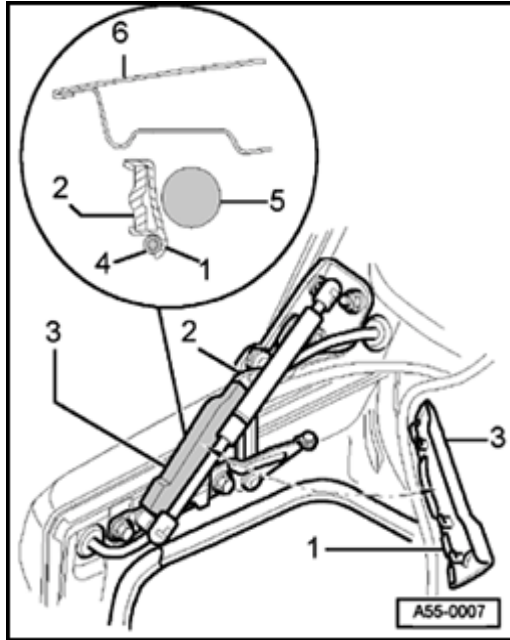
A

- Insert wiring and tubing for central locking system -4- into lower recess of cable guide at cover -1-.
- From below, attach cover -3- for rear lid hinge between gas-filled strut -5- and hinge lever, and clip onto hinge lever -2- at top so it engages audibly.

Removing and installing rear lid hinge

A

- Loosen nuts -1- at top on left and right.
Tightening torque: 21 Nm (15 ft lb)
- Remove nuts -2- at bottom on left and right.
Tightening torque: 21 Nm (15 ft lb)
- Prop up or secure lid in open position.



55-17

- Remove bolts -5- (2x).

Tightening torque: 21 Nm (15 ft lb)



- Lift lid slightly and remove hinge -4-.

Note:

For easier adjustment of the rear lid hinge, use graduations -3- and -8- marked on the hinge and the rear lid.

Removing and installing gas-filled strut



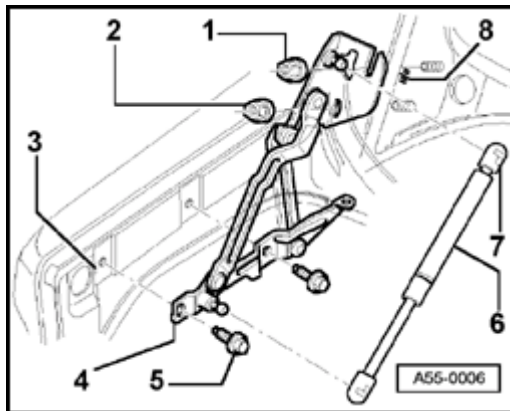
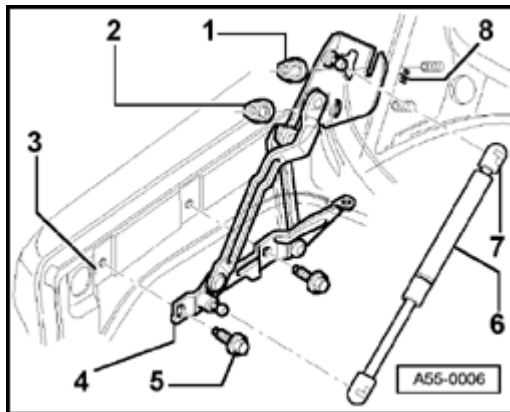
- Using screwdriver, push back retaining springs -7- slightly at both ends of gas-filled strut and clip or unclip gas-filled strut as desired.

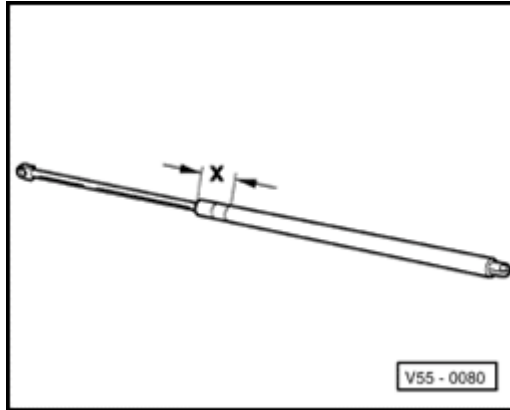
Note:

When removing or installing the gas-filled strut, push back the opened rear lid slightly beyond its normal position, being careful not to damage components.

Installing

- Clip in gas-filled strut at bottom first, then at top.
- Install with tube end of strut at rear lid.





Releasing gas from strut



- Clamp gas-filled strut in vice area -x-.
Dimension -x- = 50 mm (2 in.)
- Using saw, cut into cylindrical part of strut at point within first third of cylinder's length (measured from piston rod end of cylinder).

WARNING!

Clamp only in the area shown; otherwise there is a risk of an accident!

Note:

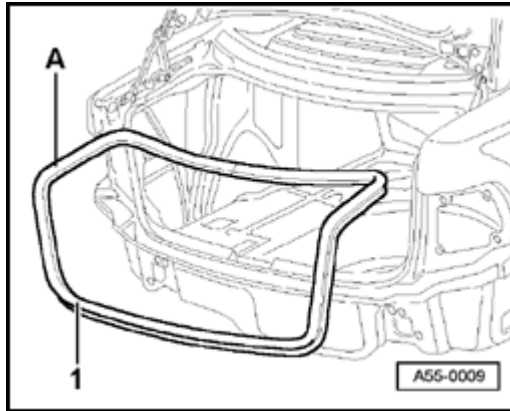
Always wear eye protection when performing this procedure. Cover the sawing area with a clean rag to contain any escaping fluid.

55-19

Rear lid seal, installing

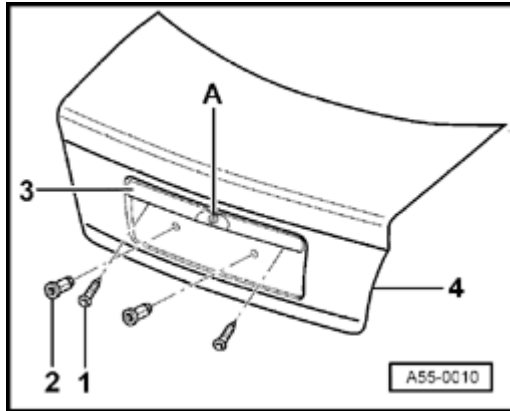


The butt joint -A- of the rear lid seal must be aligned with the ball socket of left hinge.



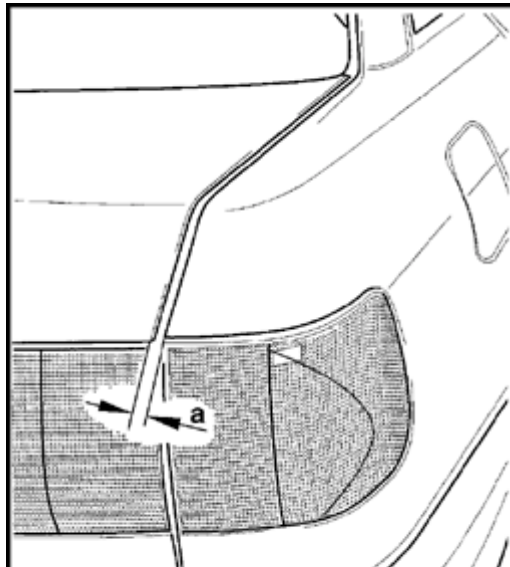
55-20

Removing and installing handle mechanism for rear lid



- Remove bolts -1- (2x).
Tightening torque: 2.5 Nm (22 in. lb)
- Attachment point -A-; remove nuts (2x) for lock cylinder on inside of lid.
Tightening torque: 6 Nm (53 in. lb)
- Pull handle mechanism -3- out enough that harness connectors for both license plate lights can be disconnected.
- Remove handle mechanism.
- Install nuts -2- (2x) using special tool VAG1618A.

Panel gap dimensions



- a- = 3.0 mm

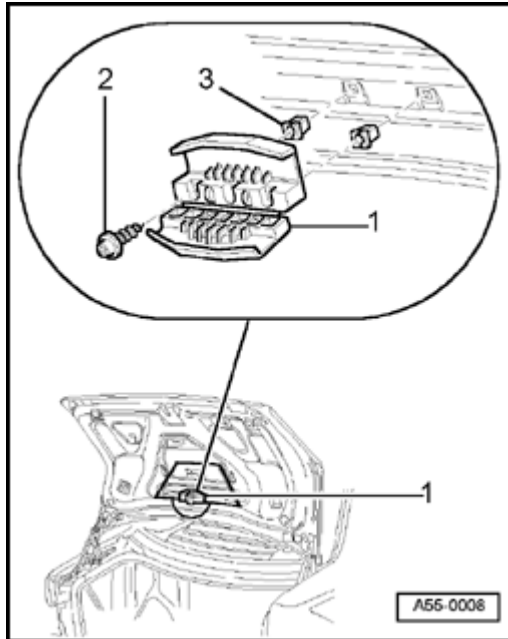
55-21

Removing and installing holder for warning triangle

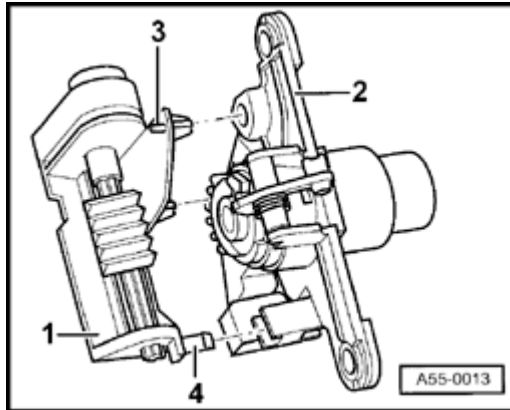
- Remove warning triangle.
 - Remove bolts -2- (2x).
- Tightening torque: 2 Nm

1 - Holder

3 - Expanding clips (2x)

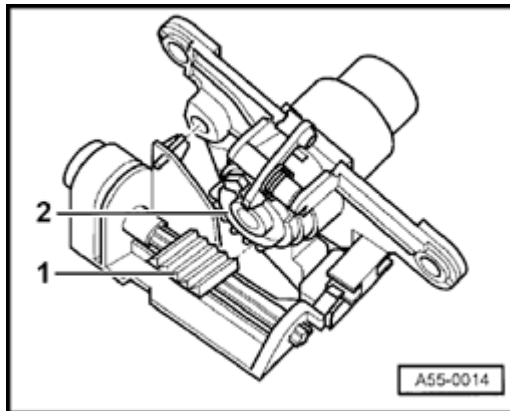


Rear lid lock actuator, removing and installing



Removing

- Remove lock cylinder ⇒ [page 55-14](#) .
- Push out retaining pins -3- (2x).
- Push tab -4- back and disconnect.
- Remove rear lid lock actuator -1-.



Installing

- Set lock cylinders in "open" position.
 - Slide ridged plate -1- to left.
- First ridge on plate -1- must snap into first groove on grooved segment -2-.

Rear lid microswitch, removing

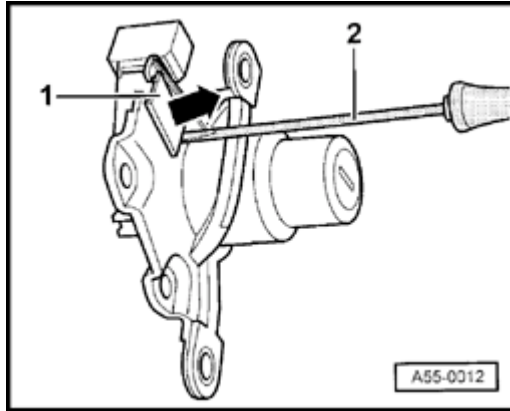
- Remove lock cylinder ⇒ [page 55-14](#) .



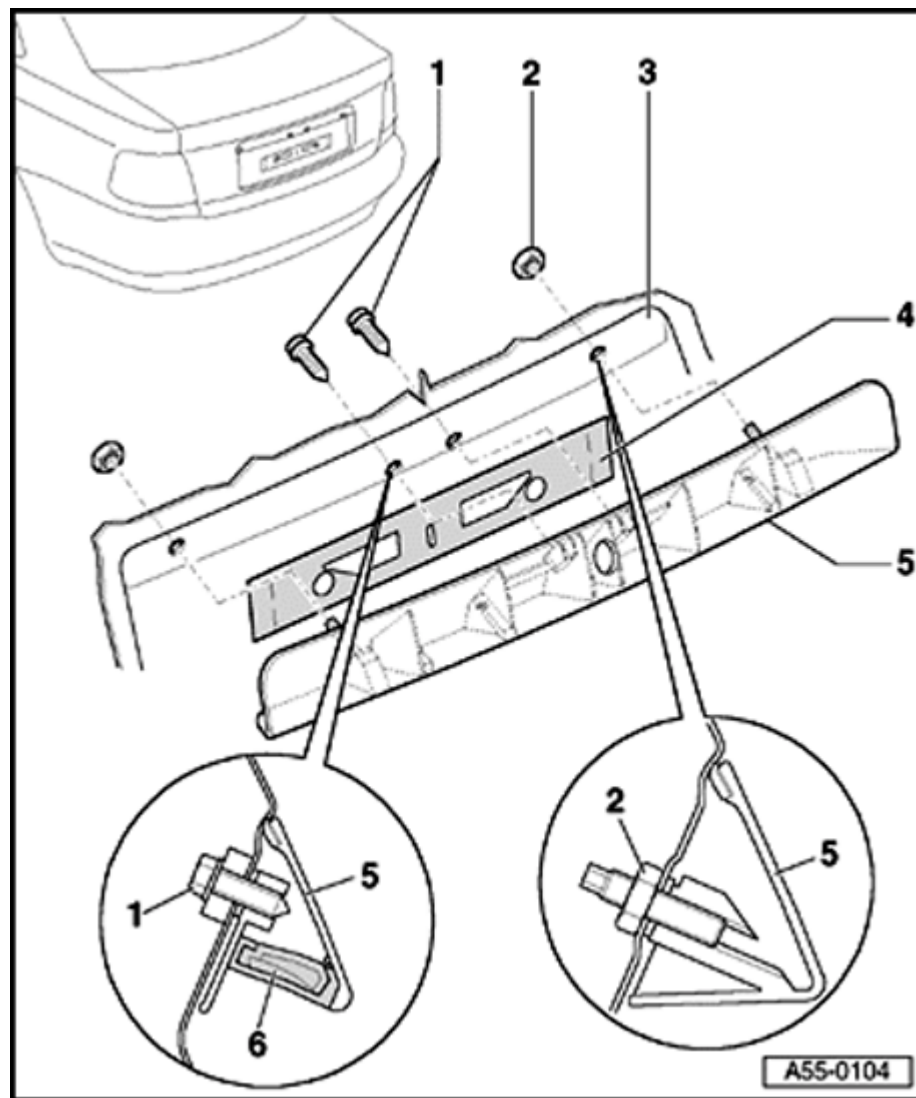
- Disengage microswitch -1- in direction of arrow and carefully push out using screwdriver.

Notes:

- ◆ *The lock cylinder cannot be adjusted for compatibility with other locks using standard tools.*
- ◆ *In order to maintain single key capability, the lock cylinder must be ordered according to the lock number.*



55-24



Rear lid (m.y. 1999 VIN 8D XA 200 001 ➤)

Grip piece, removing and installing

1 - Hex bolt

◆ 8 Nm

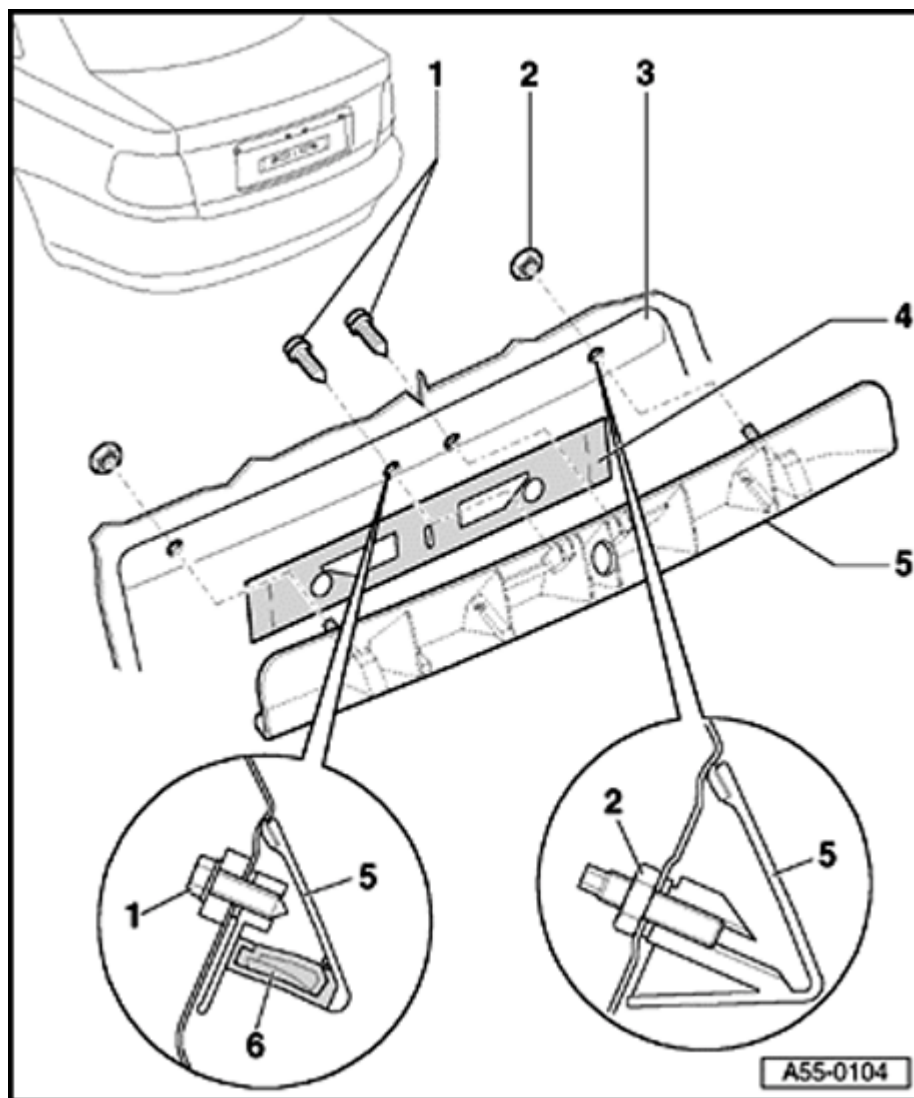
2 - Hex nut

◆ 8 Nm

3 - Tailgate

4 - Seal

55-25



5 - Grip piece

Removing:

- Before removal, remove tailgate trim.

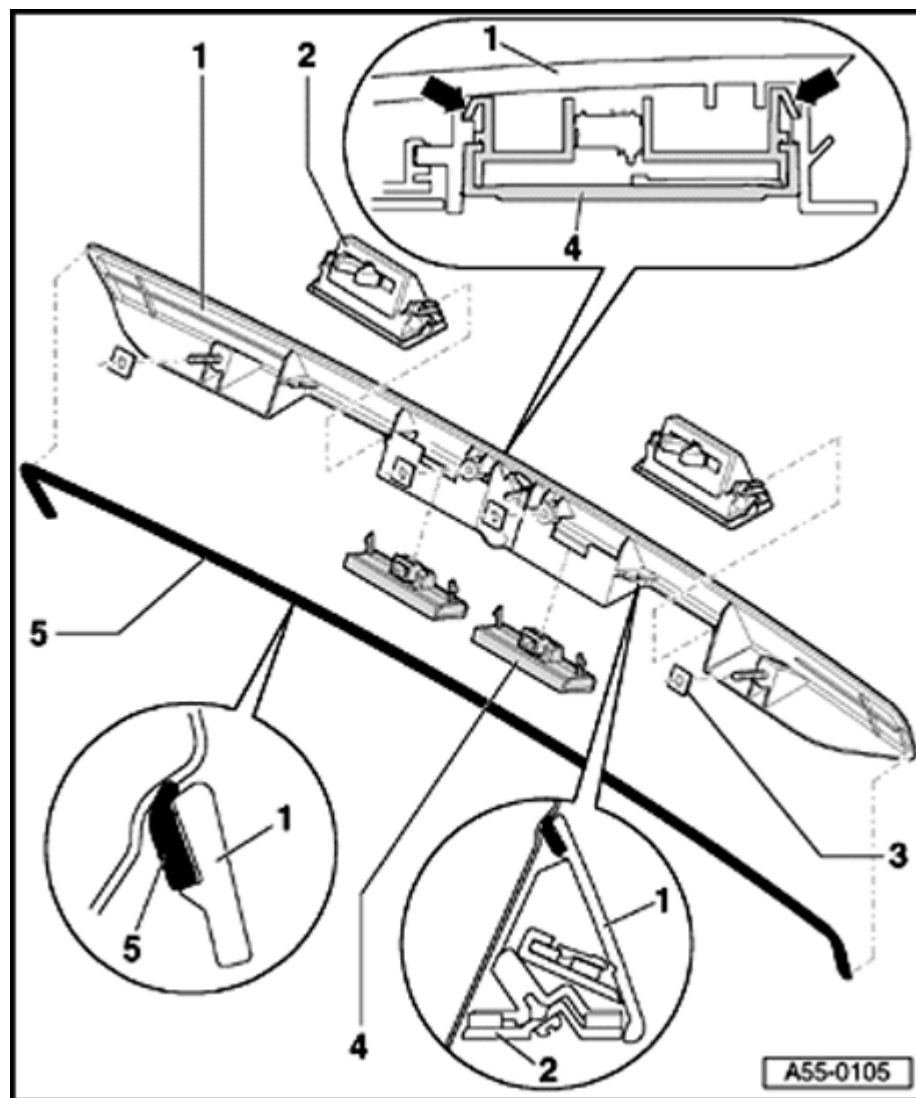
⇒ [Repair Manual, Body-Interior, Repair Group 70](#)

- Disconnect electrical harness connector for license plate lights and switch for rear lid release.
- Remove hex bolts -1- and hex nuts -3-.
- ◆ Locking system is removed from rear lid via interior of luggage compartment
- Pull grip piece out of rear lid.

Installing:

- First tighten both hex nuts -2- to 8 Nm.
- Then secure locking system using hex bolts -1- and tighten bolts to 8 Nm.
- Re-connect electrical connection.

55-26



Rear lid microswitch, removing and installing

1 - Grip piece

2 - License plate lights

3 - Sealing washer

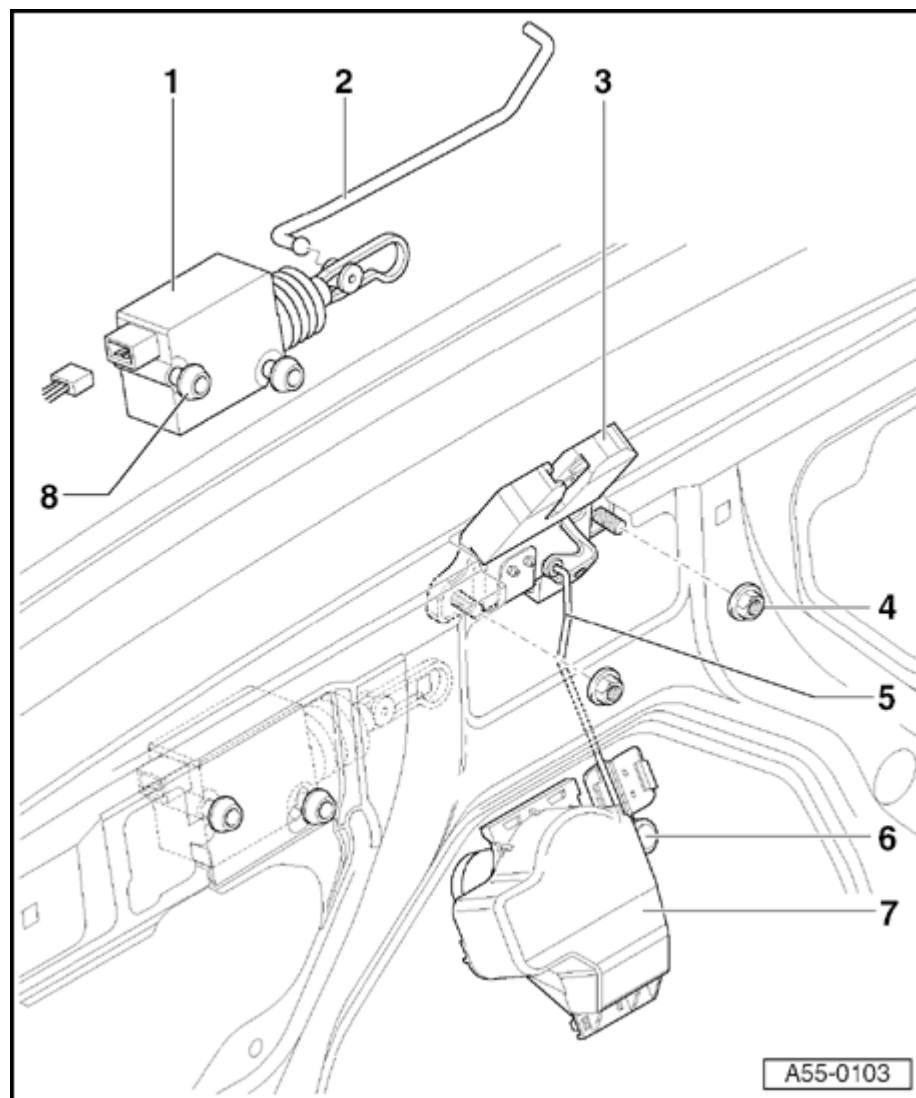
4 - Rear lid microswitch

- Disconnect electrical connectors.
- Remove grip piece.
- Release locking mechanism (arrow) and remove microswitch.

5 - Seal

- ◆ Adhesion surface must be free of dust and grease
- ◆ Self adhesive; remove protective foil before application and press seal on in center

55-27



Tailgate lock, removing and installing

1 - Rear lid lock actuator

- ◆ Before removing, first disengage operating rod -2- from rear lid lock ⇒ [Fig. 6](#)
 - Disconnect electrical harness connector.
 - Remove Torx bolts -8-.

2 - Operating rod

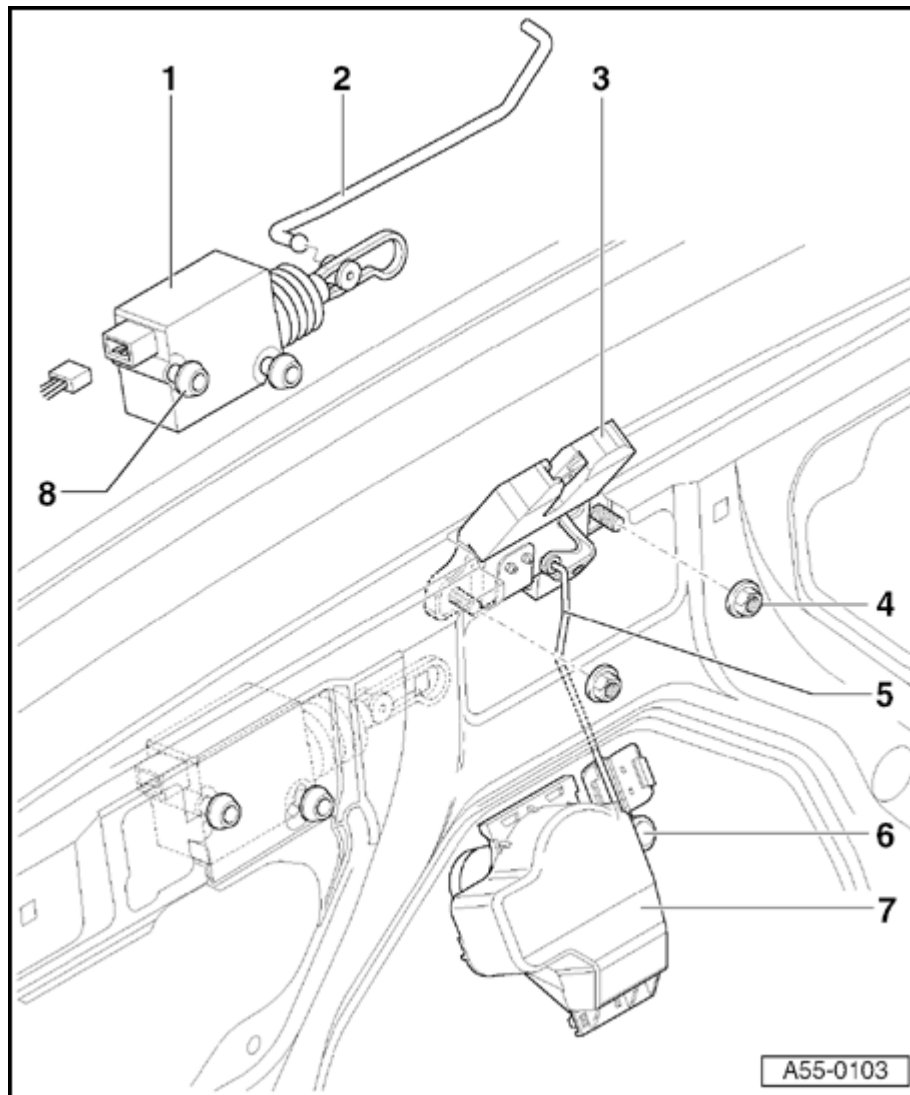
- ◆ Disengage and engage in rear lid lock ⇒ [Fig. 6](#)

3 - Tailgate lock

Removing:

- Disengage operating rod -2- and connecting rod -5- from rear lid lock.
- Disconnect electrical harness connector.
- Remove hex nuts -4- and take out rear lid lock.

55-28

**4 - Hex nut**

◆ 8 Nm

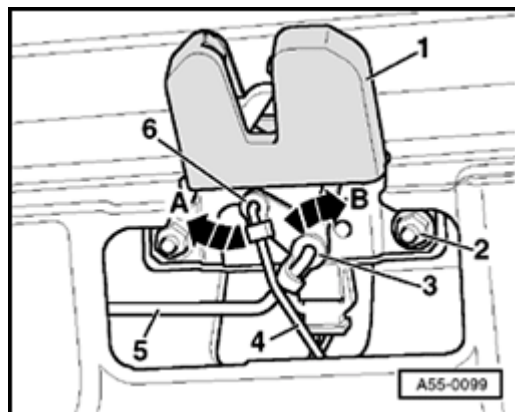
5 - Operating rod◆ Unclip and clip in rear lid lock ⇒ [Fig. 6](#)**6 - Hex nut**

◆ 8 Nm

7 - Lock mechanism◆ Removing ⇒ [page 55-30](#)**8 - Torx screw**

◆ 2.5 Nm

55-29



A

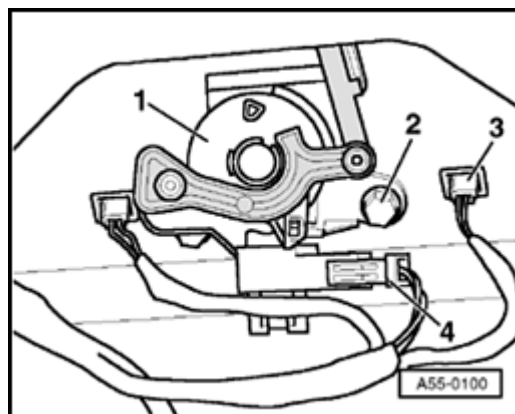
Fig. 6 Disengaging and engaging operating and connecting rods

- Swing hinge arm -6- in direction of arrow -A- and pull out connecting rod -4-.
- Swing hinge arm -3- in direction of arrow -B- and pull out connecting rod -5-.
- To remove rear lid lock -1- remove hex bolts -2-.

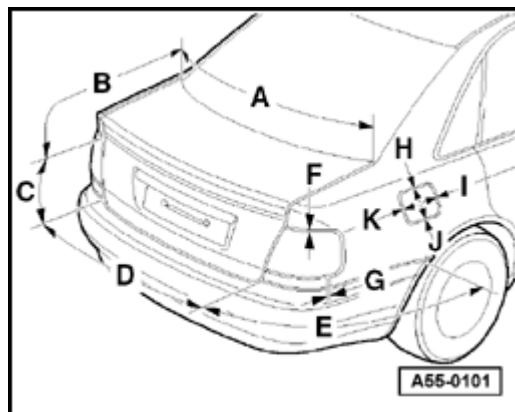
55-30

Tailgate lock system, removing and installing

- Remove tailgate trim.
- Disengage connecting rod to rear lid lock.
- Disconnect harness connectors -3- from microswitch and -4- from locking system.
- Remove hex bolts -2- and locking system -1- from rear lid.



55-31



4 Tailgate gap, dimensions

Letter	Actual gap dimension (mm)	Parrallelism (mm)
A	$4.7 + 1.5$	
B	$2.9 + 1$	1
C	$3.3 + 1$	
D	$4.9 + 1$	1
E	$3.5 + 1$	0.5
F	$2.5 + 0.5$	0.5
G	$1.5 + 0.5$	0.2
H	2.5 ± 0.1	
I	3.3 ± 0.1	
J	3.3 ± 0.2	
K	3.0 ± 0.4	

Tailgate (Avant), (► m.y. 1999 VIN 8D XA 200 000)

Tailgate, removing and installing

- Remove tailgate trim.

⇒ [Repair Manual, Body-Interior, Repair Group 70](#)

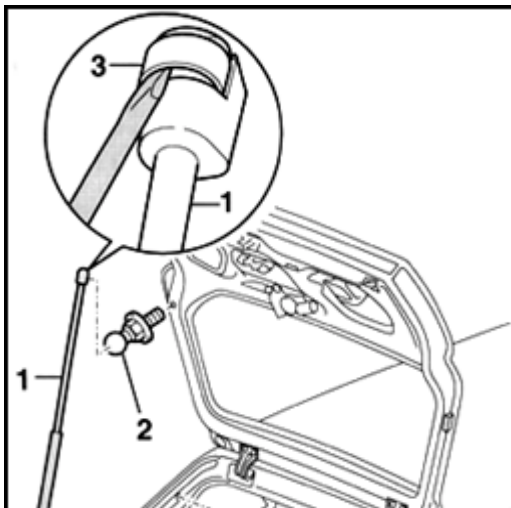
- Disconnect or remove harness connectors and hoses (i.e. for central locking and rear window washer system).
- Prop up and secure tailgate in open position.
- Using screwdriver, lift retaining spring -3- as shown and remove gas-filled strut -1- from upper ball stud -2-.

Note:

Following complete removal of gas-filled strut, check for correct positioning during installation.

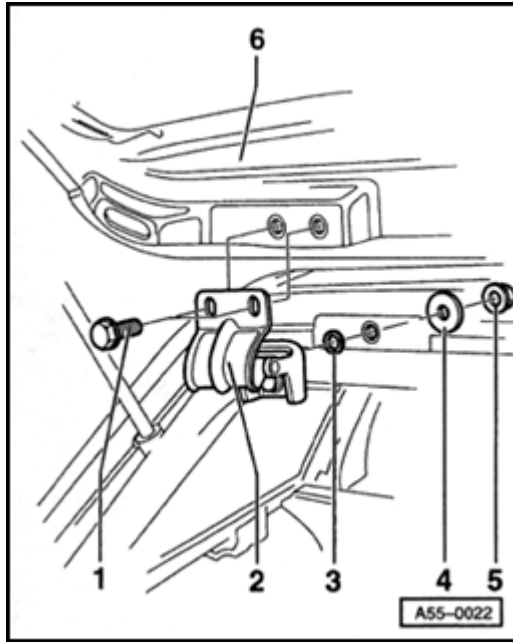
Sound insulation components must be installed on the body side.

- To install, press gas-filled strut onto ball studs so that it engages in position.



Ball stud tightening torque: 15 Nm -1 Nm

55-33

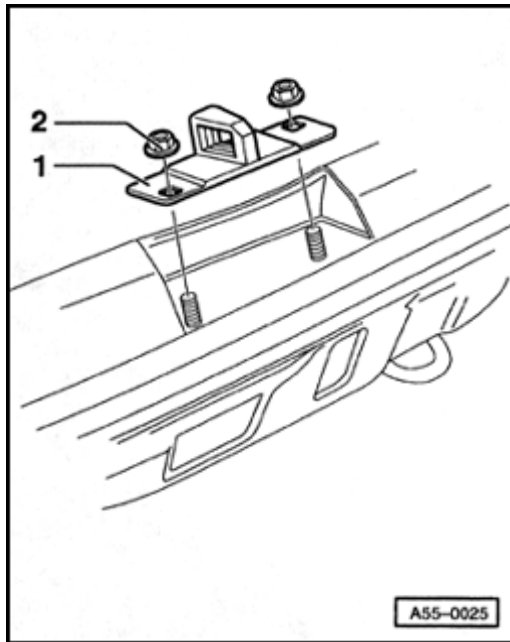


- Remove hex bolt -1- (2x) from tailgate -6-.
- Tightening torque: 21 Nm (15 ft lb)

Tailgate, adjusting

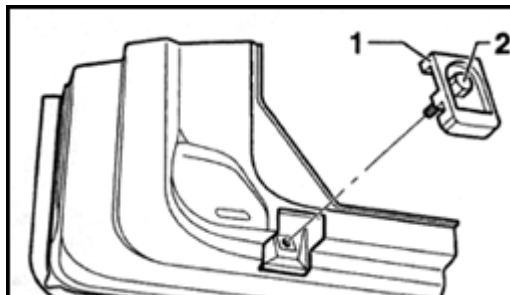
Note:

Before installing a new tailgate the gas-filled struts must be installed.



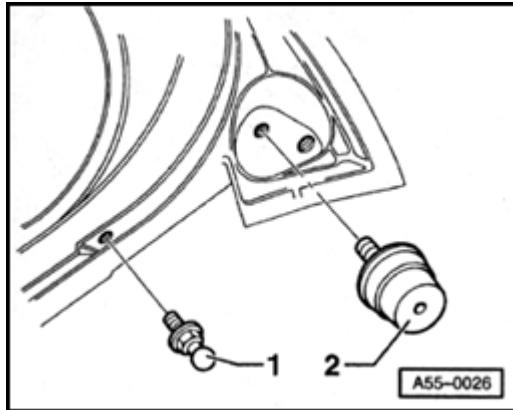
A

- Loosely attach striker -1- with nuts -2-.



A

- Loosely attach lower stop -1- (on trim of rear hatch) using hex bolt -2-.



A

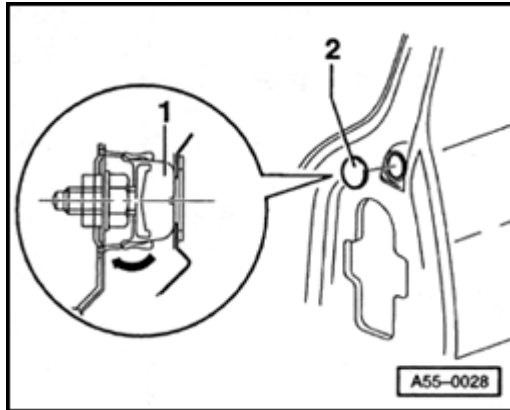
- Screw upper stop -2- in fully.
- Close rear hatch to appropriate position (flush).
Rear lock and striker must engage.
- Open rear hatch and tighten mounting nut for striker to 8 Nm (71 in. lb).
- Install clay onto upper stop.
- Close and open tailgate.
- Determine thickness of clay and adjust stop accordingly.
- Unscrew stop another 1.5 to 2 rotations.

Note:

Two (2) rotations represent a preload of 2.5 mm and a vertical shift of 0.8 mm at point -C- ⇒ [page 55-41](#) .

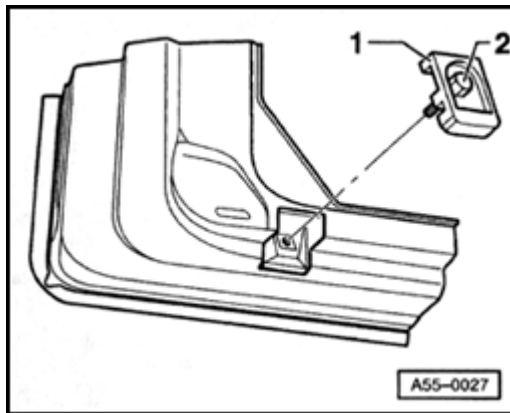
- Check shutting comfort and gap dimensions.

55-36



A

- Screw stop -1- into lock nut.
Tightening torque: 21 Nm (15 ft lb)
- Push cover on stop up toward tailgate surface (arrow).
- 2 - Protective cap

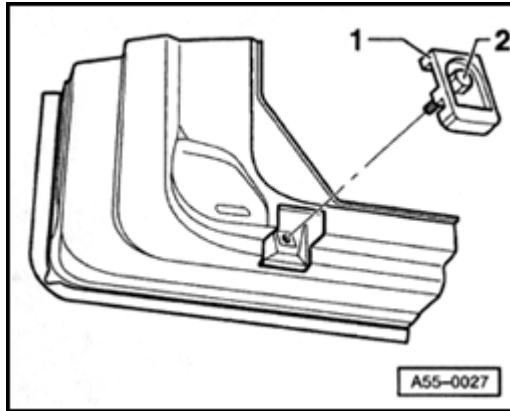


A

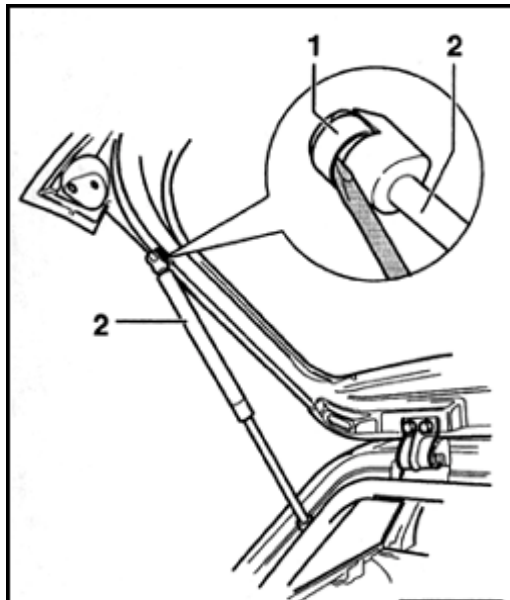
- Loosen hex bolt -2- and pull lower stop -1- out slightly.
- Tighten hex bolt -2- slightly and close rear hatch.
- Using sensor gauge, set stop -1- from inside at 1 mm clearance to tailgate trim.

CAUTION!

Stop buffers must not make contact with rear lid trim when rear lid is closed.

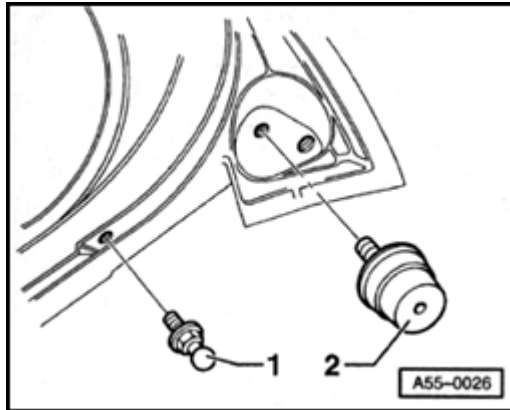


- Open hatch and tighten hex bolt -2- for stop to 8 Nm (71 in. lb).
- Check gap dimensions ⇒ [page 55-41](#) .

**Removing and installing gas-filled strut**

- Lift retaining spring on gas-filled strut -1- and remove strut from ball stud.
- To install, press gas-filled strut onto ball stud.

55-38

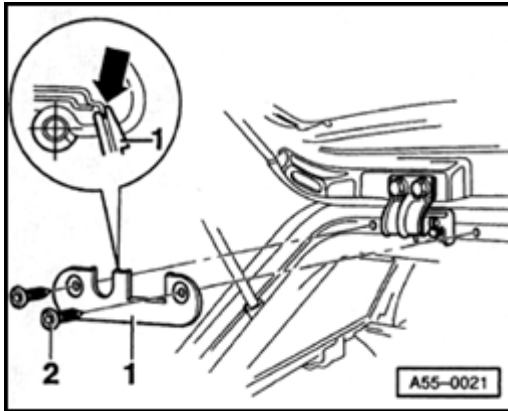


Removing and installing ball stud

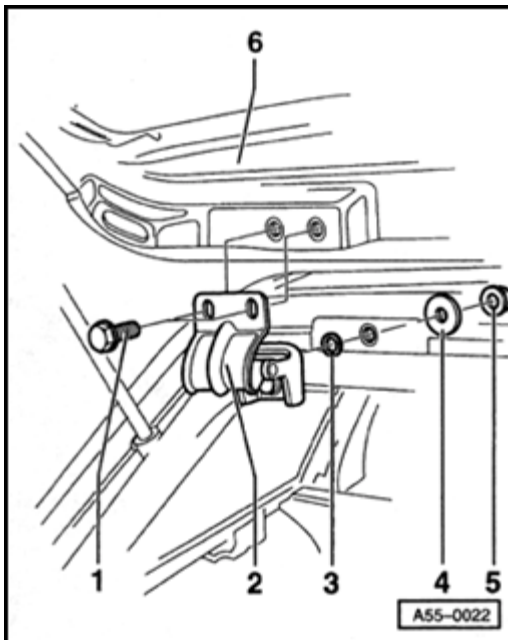
- Unscrew ball stud -1- and remove with seal.
- For installation, tighten to 14 Nm (10 ft lb).

55-39

Rear lid hinge, removing and installing

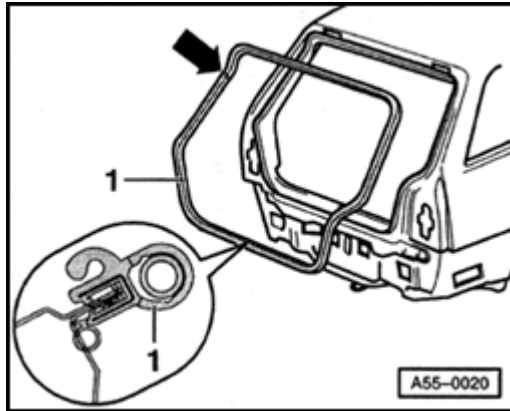


- Remove screws -2- and cover -1- for hinge.
- To install, first center cover -1- in notches (arrow) in roof flange and then tighten screws -2- to 2.5 Nm (22 in. lb).



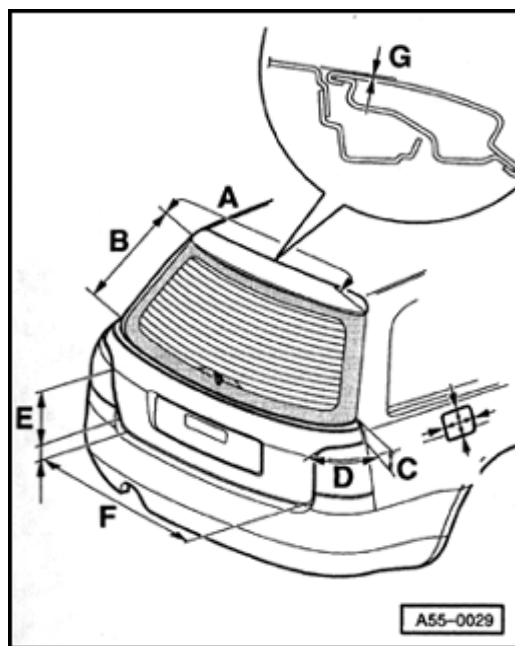
- Remove rear roof molding trim.
- ⇒ [Repair Manual, Body-Interior, Repair Group 70](#)
- Remove hex bolt -5-.
 - Remove hex bolt -1-.
 - Replace seal -3- during installation.
 - Tighten hex bolt and bolt to 21 Nm (15 ft lb).

Tailgate seal, removing and installing



- Open tailgate and remove seal.
- When installing, vulcanized butt joint (arrows) must be placed on body side at height of ball stud.
- Press seal -1- onto body as shown.

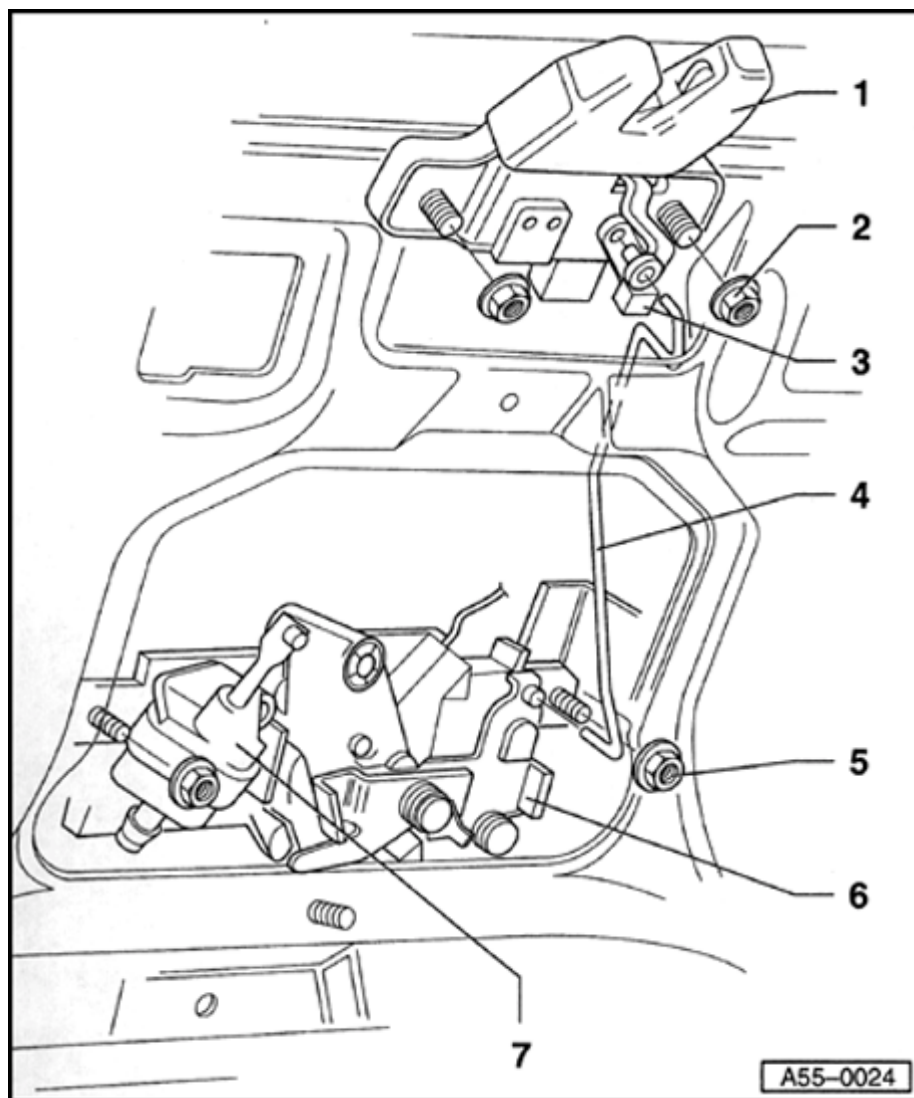
55-41



4 Gap dimensions, tailgate

Letter	Actual gap dimension (mm)	Parrallelism (mm)
-A-	4.0 +1	0.5
-B-	5.0 +1	1
-C-	4.0 +1	0.5
-D-	3.4 +1	0.5
-E-	3.4 +1	0.5
-F-	5.0+1	
-G-	1.0	
-H-	2.5 ± 0.1	
-I-	3.3 ± 0.1	
-J-	3.3 ± 0.2	
-K-	3.0 ± 0.4	

55-42



Tailgate lock, removing and installing

1 - Tailgate lock

- To remove, swing out hinge arm -3- from operating rod -4- and unhook operating rod from tailgate lock.
- Remove hex bolts -2- and tailgate lock.

2 - Hex nut

- ◆ 8 Nm (71 in. lb)

3 - Hinge arm

- ◆ Must be swung over operating rod -4-

4 - Operating rod

- To remove, first disengage from lock system -6-.

5 - Hex nut

- ◆ 8 Nm (71 in. lb)

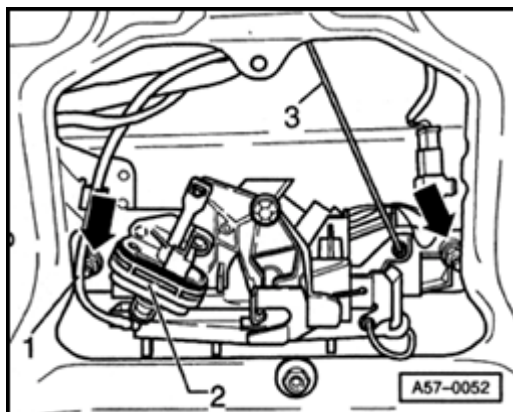
6 - Lock system

- ◆ Removing ⇒ [page 55-43](#)

7 - Tailgate lock actuator

- ◆ Removing ⇒ [page 55-44](#)

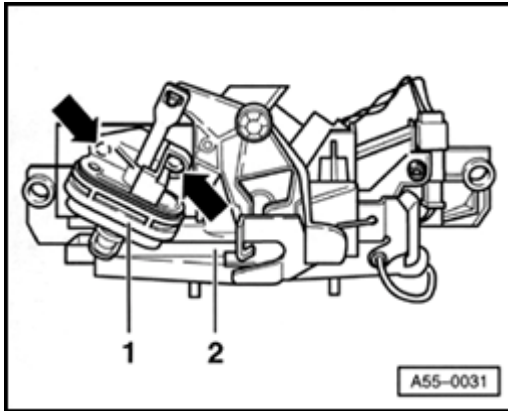
Tailgate lock system, removing and installing



A

- Remove tailgate trim.
- ⇒ [Repair Manual, Body-Interior, Repair Group 70](#)
- Disengage lock system at plug for vacuum line -1- and remove from lock actuator -2-.
 - Unclip operating rod -3-.
 - Disengage locating hooks on release handle and remove ⇒ [page 55-47](#).
 - Remove hex bolts (arrow) and remove lock system from tailgate.
- Hex bolt tightening torque: 8 Nm (71 in. lb)

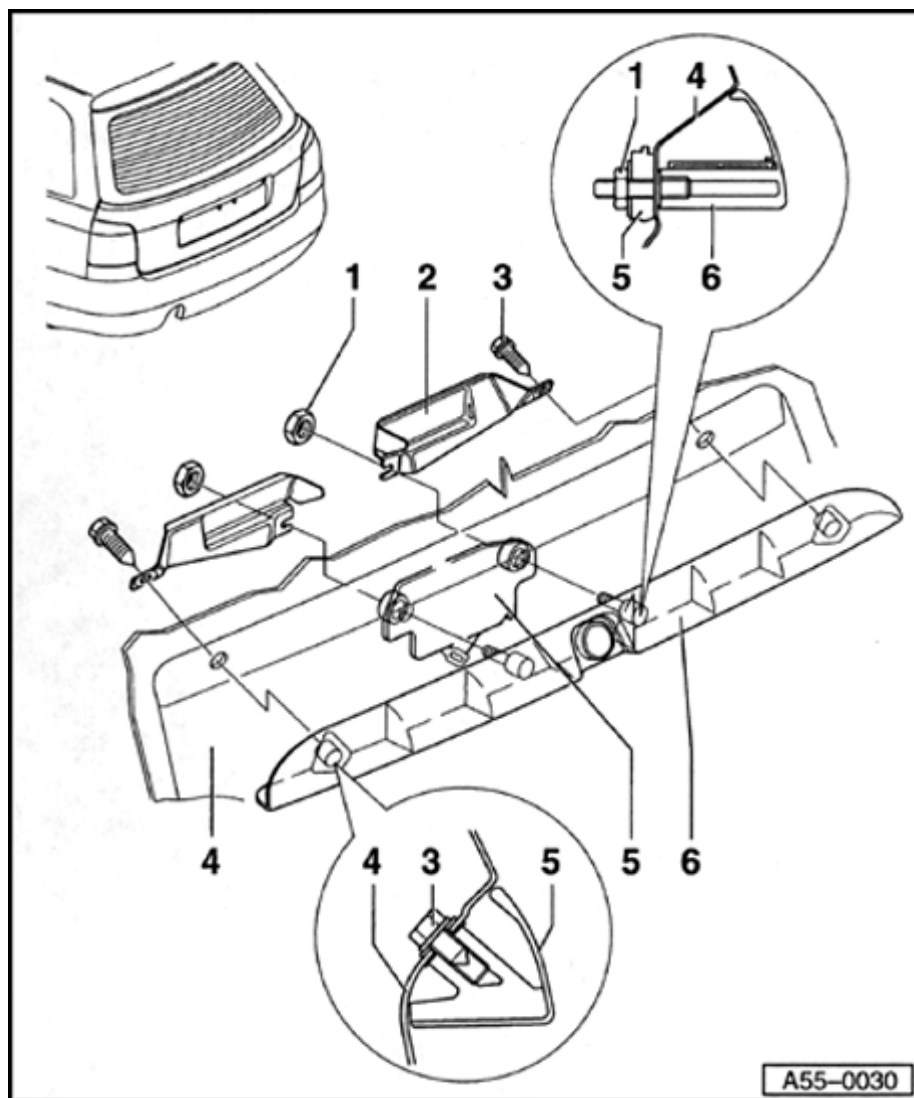
Lock actuator, removing and installing



- Push out clamping pins (arrow) and remove lock actuator -1- from lock -2-.
- Clamping pins must be snapped into expanding clips again during installation.
- Pry out using screwdriver if necessary.

Note:

Illustration shows component after removal.



Grip piece, removing and installing

1 - Hex nut

◆ 8 Nm (71 in. lb)

2 - Bracket

- To remove, remove hex bolts -1- and bolts -3-.

Note:

Part was discontinued shortly following series launch.

3 - Hex bolt

◆ 8 Nm (71 in. lb)

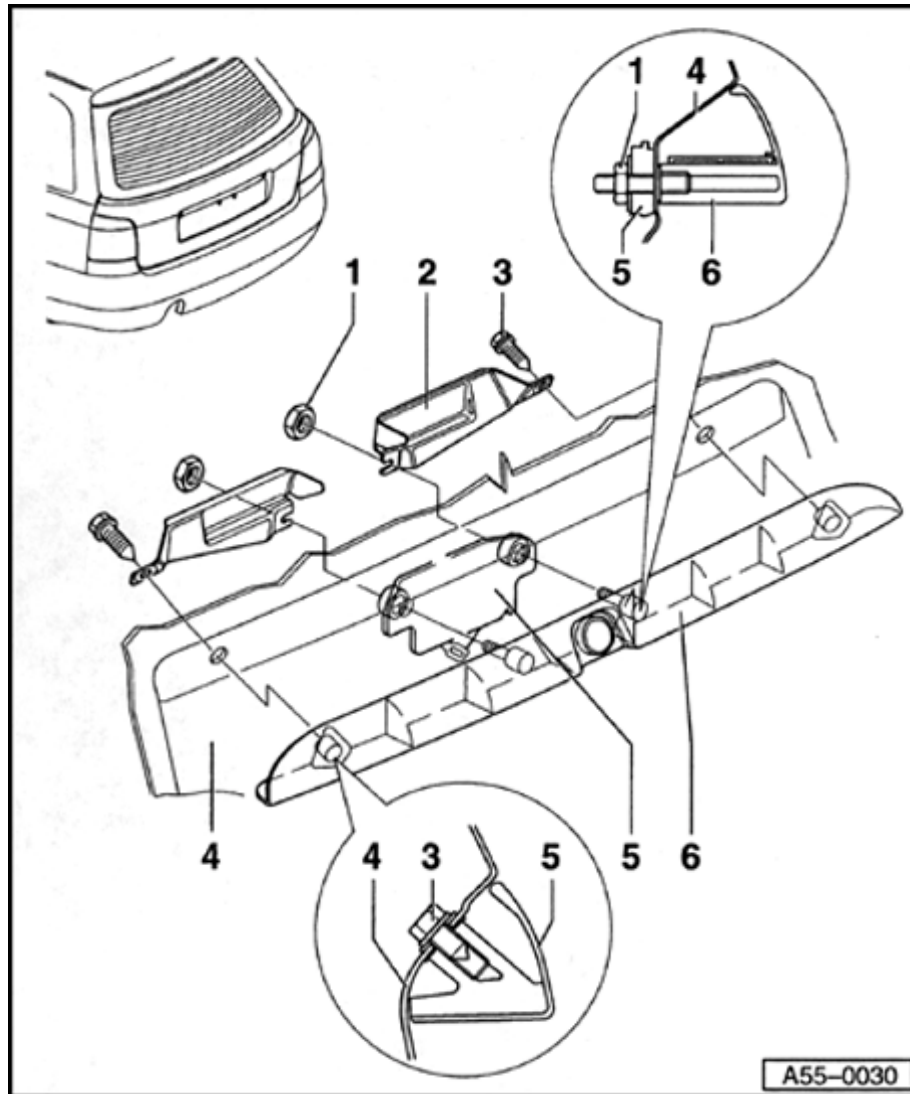
4 - Tailgate

◆ Removing and installing ⇒ [page 55-32](#)

5 - Lock mechanism

- To remove, remove hex bolts -1-.
- Disengage locating hooks on release handle (⇒ [Fig. 1](#)) and remove.
- Remove lock mechanism.

55-46



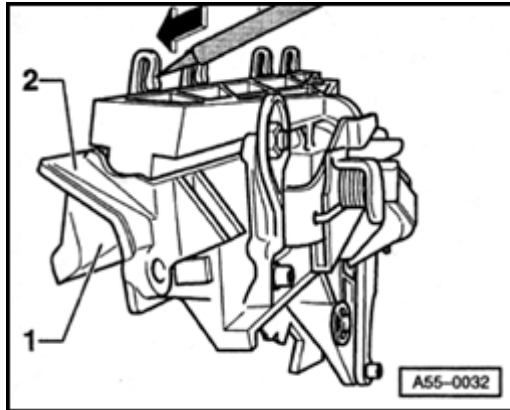
6 - Grip piece

- Before removal, remove tailgate trim.

⇒ [Repair Manual, Body-Interior, Repair Group 70](#)

- To remove, remove hex nuts -1- and bolts -3-.
- Pull grip piece slightly out of tailgate and disconnect harness connectors for license plate lights.
- To install, insert grip piece into tailgate holes.
- Thread bracket -2- at lock mechanism and attach to grip piece using external securing screws.

55-47



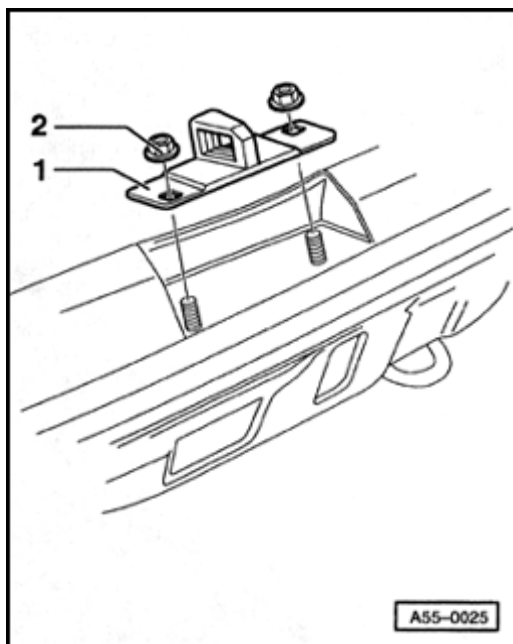
A

Fig. 1 Removing and installing lock unit

- Using screwdriver, press in and disengage securing hooks (arrow) on inside of tailgate.
- Pull release handle -1- down and out of lock system -2- under grip piece.

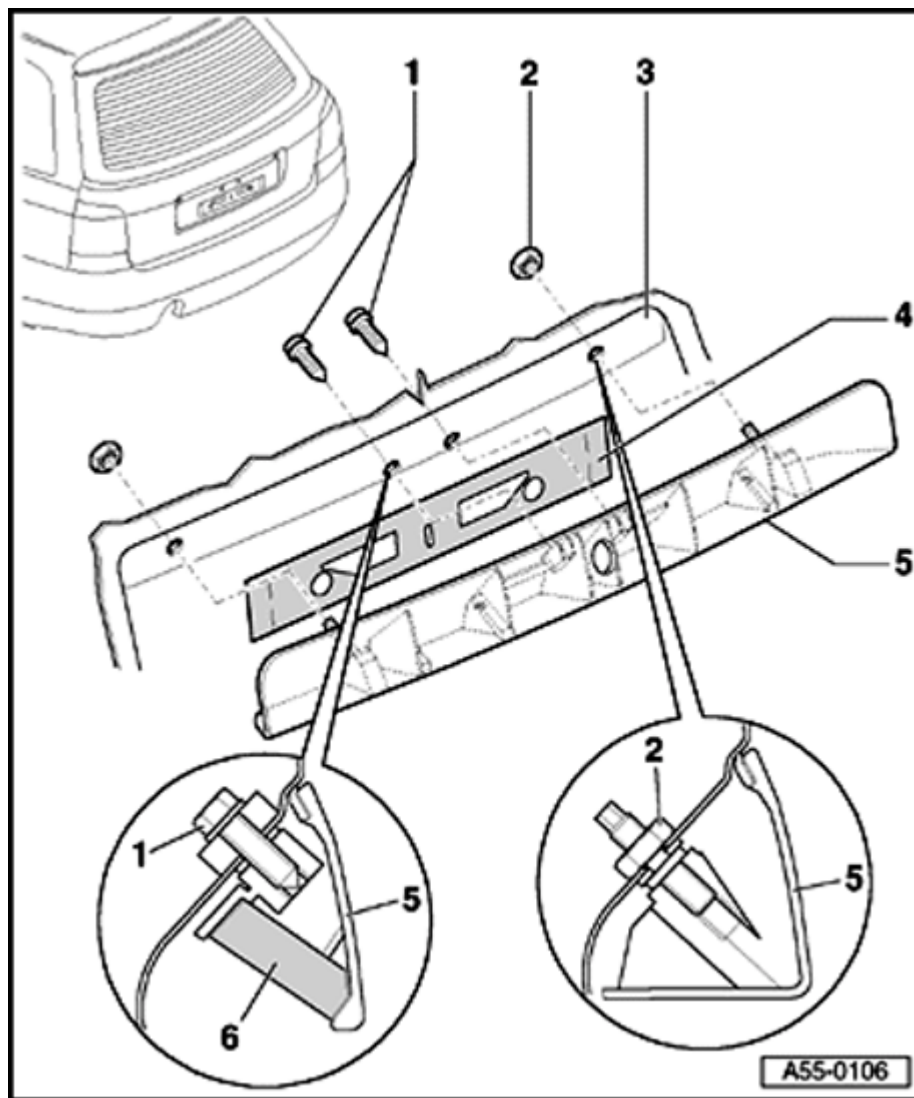
Tailgate striker, removing and installing

- Before removing striker, mark its position using soft pencil.

**A**

- To remove, unscrew hex nuts -2- and remove striker -1-.
- Position new striker according to markings and tighten hex nuts finger-tight.
- Close tailgate until lock engages and tailgate is in flush position.
- Open tailgate and tighten hex nuts to 8 Nm (71 in. lb).
- Check for flushness and shutting comfort; adjust if necessary.

55-49



Tailgate (Avant) (m.y. 1999 VIN 8D XA 200 001 ➤)

Grip piece, removing and installing

1 - Hex bolt

◆ 8 Nm

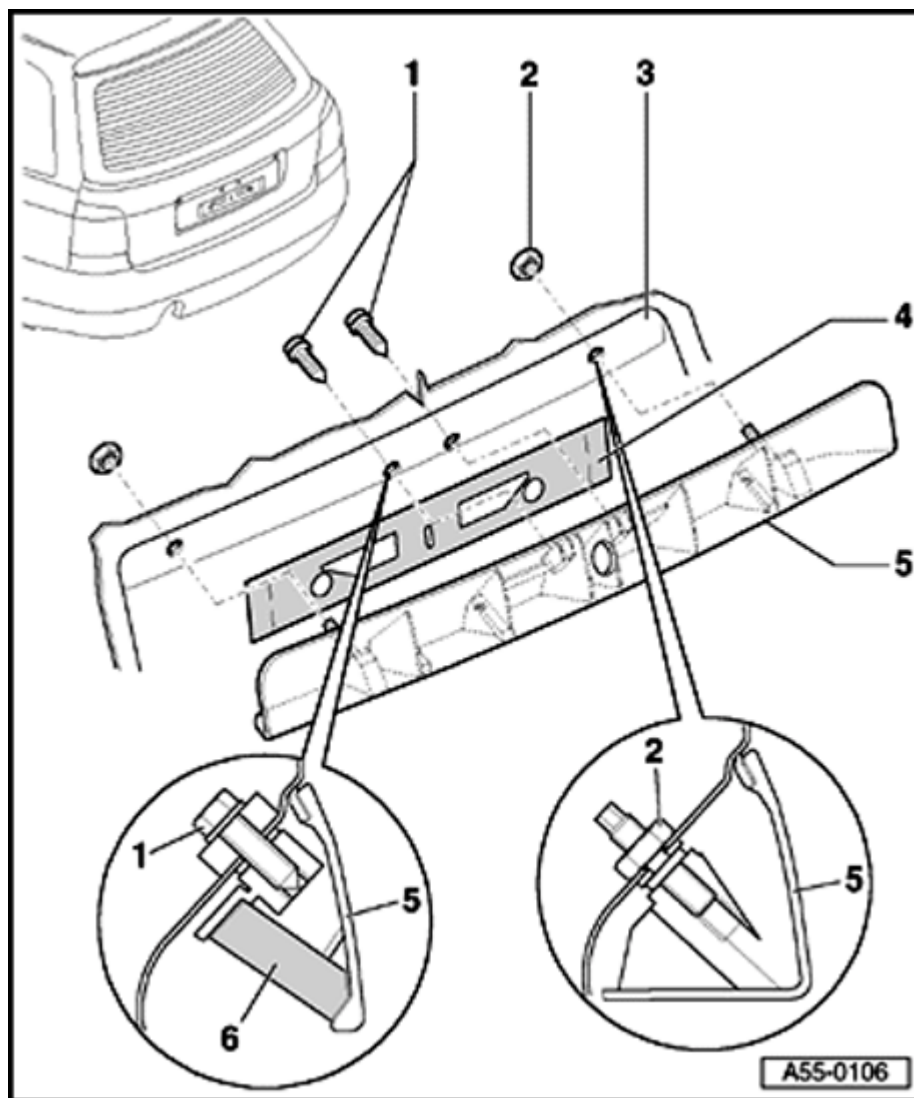
2 - Hex nut

◆ 8 Nm

3 - Tailgate

4 - Seal

55-50



5 - Grip piece

Removing:

- Before removing, remove tailgate trim.

⇒ [Repair Manual, Body-Interior, Repair Group 70](#)

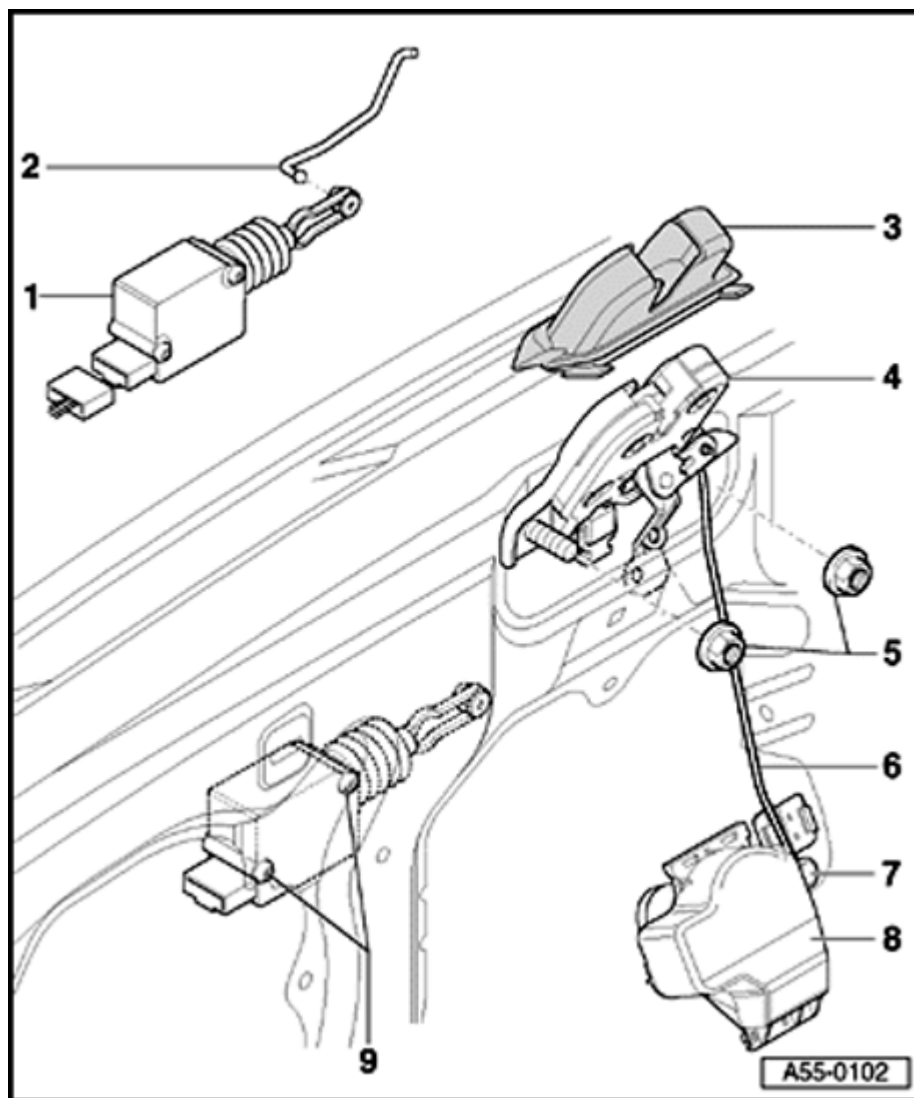
- Disconnect electrical harness connector for license plate lights and switch for rear lid release.
- Remove hex bolts -1- and hex nuts -3-.
- Locking system is removed via interior of luggage compartment.
- Pull grip piece out of rear lid.

Installing:

- Install grip piece on rear lid via rear lid bore holes.
- First tighten both hex nuts -2- to 8 Nm.
- Then secure locking system using hex bolts -1- and tighten bolts to 8 Nm.

6 - Microswitch for rear lid release

♦ Removing ⇒ [page 55-26](#)



Tailgate lock, removing and installing

1 - Lock actuator for rear lid

- ◆ Before removing, first disengage operating rod -2- from rear lid lock ⇒ [Fig. 1](#)
- ◆ Remove Torx bolts -9- and take out actuator

2 - Operating rod

- ◆ Unclip and clip in rear lid lock ⇒ [Fig. 1](#)

3 - Cap

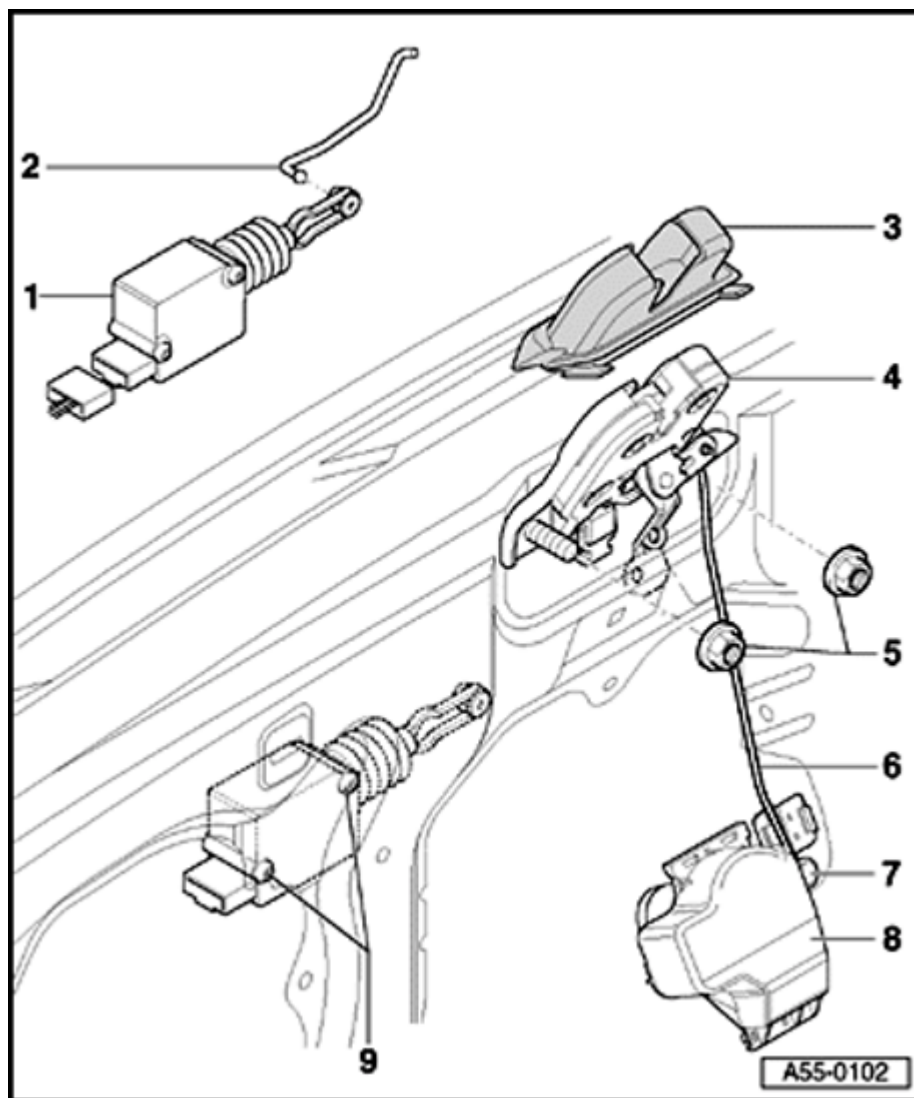
- ◆ To remove, unclip from rear lid lock and remove ⇒ [page 55-54](#) .

4 - Tailgate lock

Removing:

- Disengage operating rod -2- and connecting rod -6- from rear lid lock.
- Remove hex nuts -4- and take out rear lid lock.
- ◆ Locking system is removed from rear lid via interior of luggage compartment.
- Pull grip piece out of rear lid.

55-52



Installing:

- First tighten both hex nuts -2- to 8 Nm.
- Then secure locking system using hex bolts -1- and tighten bolts to 8 Nm.

5 - Hex nut

- ◆ 8 Nm

6 - Operating rod

- ◆ Unclip and clip in rear lid lock ⇒ [Fig. 1](#)

7 - Hex nut

- ◆ 8 Nm

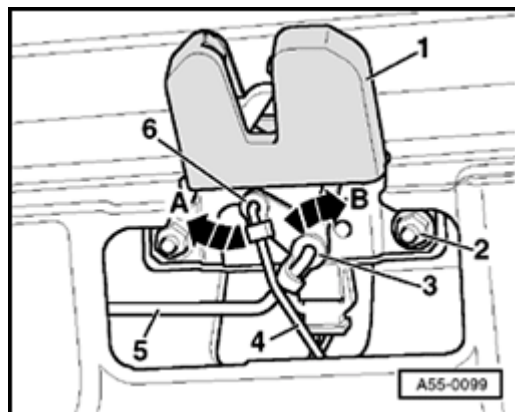
8 - Lock mechanism

- ◆ Removing ⇒ [page 55-55](#)

9 - Torx screw

- ◆ 2.5 Nm

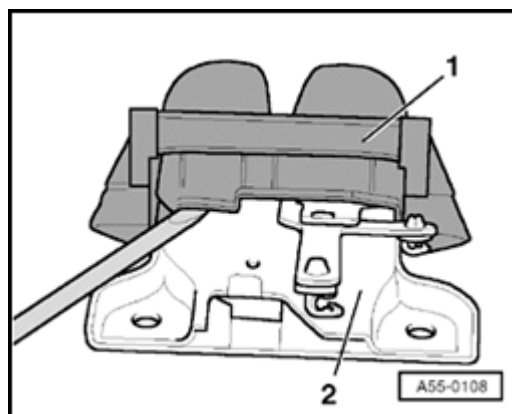
55-53



A

Fig. 1 Disengaging and engaging operating and connecting rods

- Swing hinge arm -6- in direction of arrow -A- and pull out connecting rod -4-.
- Swing hinge arm -3- in direction of arrow -B- and pull out connecting rod -5-.
- To remove rear lid lock -1- remove hex nuts -2-.

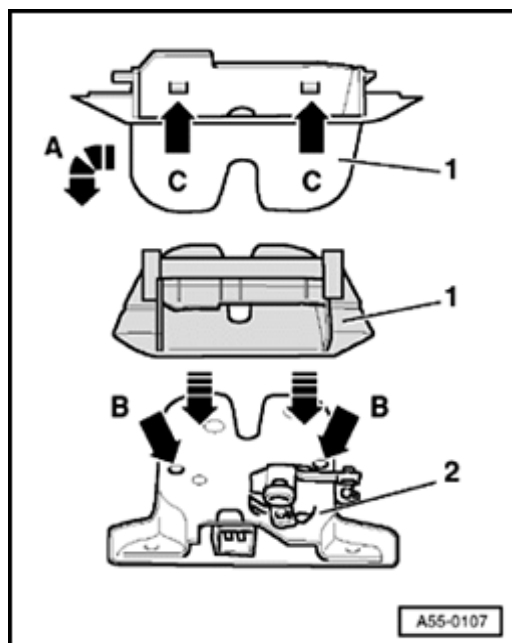


A

Fig. 2 Removing cover for rear lid lock**Note:**

Part is shown in removed condition for the sake of illustration.

- Tailgate trim must be removed before removing cover.
- To remove, disengage locking mechanisms (arrows) using a screwdriver and pull off cover.



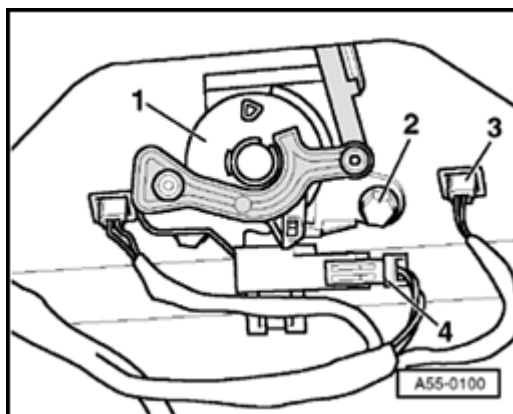
A

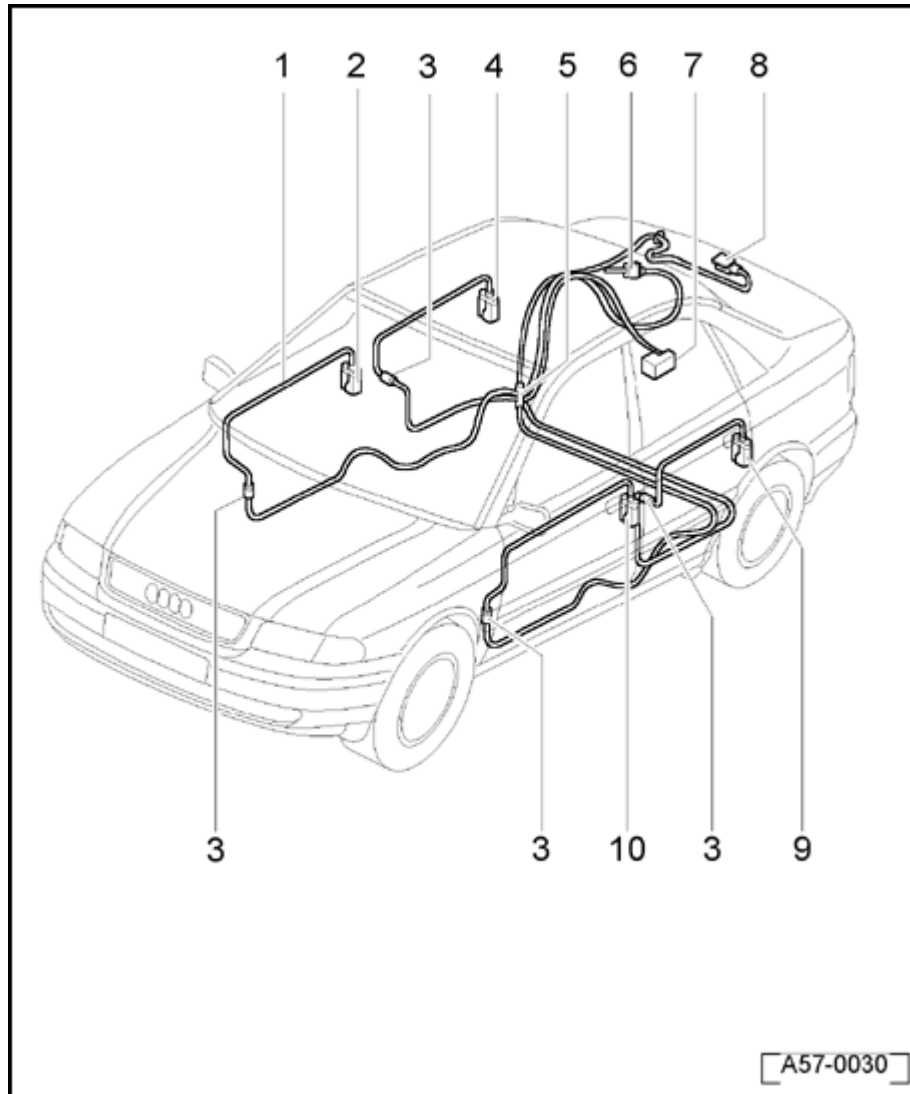
Fig. 3 Installing cover for rear lid lock

- Tilt cover 90° in direction of arrow -A-.
- Slide cover -1- onto rear lid lock -2- until retaining tabs (arrows -C-) engage completely in bore holes (arrows -B-) on both sides.
- Perform a function test for proper closure of rear lid.

Tailgate lock system, removing and installing

- Remove tailgate trim.
- Disengage connecting rod to rear lid lock.
- Disconnect harness connectors -3- from microswitch and -4- from locking system.
- Remove hex bolts -2- and locking system -1- from rear lid.





Central locking system

Assembly overview

1 - Vacuum line

2 - Right-front door lock actuator

- ◆ Removing and installing ⇒ [page 57-12](#)

3 - Vacuum line connectors

- ◆ Disengage harness connectors ⇒ [page 57-42](#)
- ◆ Additional vacuum line connectors are located at bottom of A-pillar and in boot at B-pillar

4 - Right-rear door lock actuator

- ◆ Removing and installing ⇒ [page 58-14](#)

5 - Fuel filler flap lock actuator

- ◆ Removing and installing ⇒ [page 57-46](#)

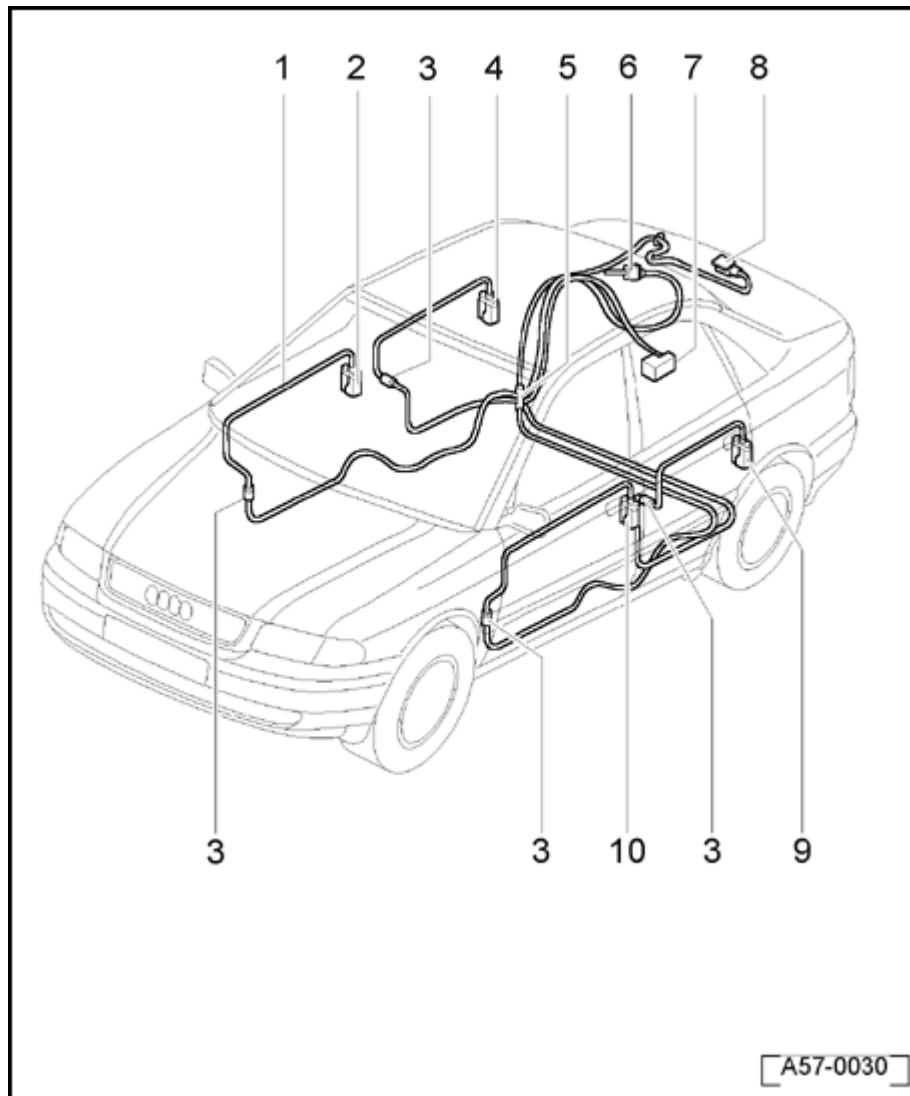
6 - Central locking system pump

- ◆ Removing and installing ⇒ [page 57-49](#)

7 - Distribution box

- ◆ Connected with all other wires excluding wire for rear lid

57-40

**8 - Left-front door lock actuator**

- ◆ Removing and installing same as for right door

9 - Rear lid lock actuator

- ◆ Removing and installing ⇒ [page 57-47](#)

10 - Left-rear door lock actuator

- ◆ Removing and installing same as for right door

Repairing central locking system

For additional information ⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations binder.

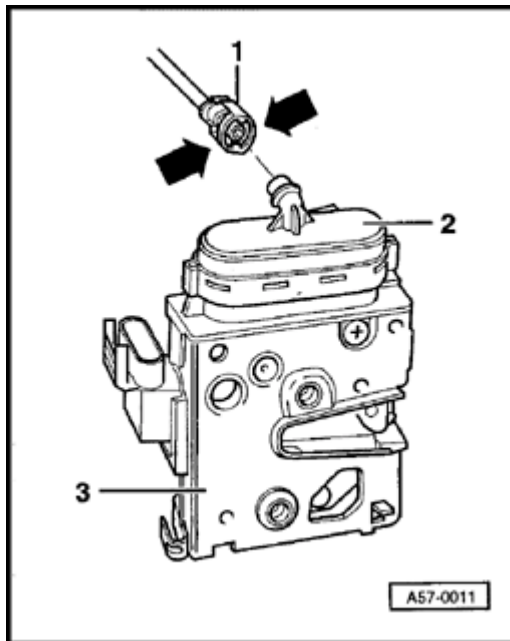
Notes:

- ◆ *After the car has been parked for a lengthy time and/or after replacing the central locking system pump, the central locking system will not function properly until prompted repeatedly.*
- ◆ *When the system is operating correctly, all locks will close within 2 seconds.*
- ◆ *If the pump operates for longer than 5 seconds, there is a leak in the system.*
- ◆ *When there is a leak in the system, the pump must not run for more than 30 seconds. The pump's control unit must shut it off at this point.*
- ◆ *All the lock actuators are equipped with special vacuum line connectors that must lock when plugged in.*

Vacuum line connectors, disengaging

Note:

Do not simply pull on the lock actuators to disconnect; the locking mechanism installed on the harness connector must first be disengaged.



- To disengage lock, squeeze harness connector on locking mechanism at arrows.
- Disconnect harness connector.

57-43

Damaged vacuum line, repairing

- Remove damaged area using knife.
- Cut connecting line e.g. ET-Nr 533 862 225 to proper length and push onto vacuum line.

57-44

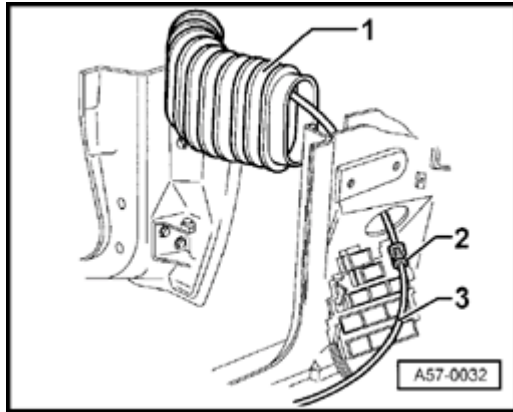
A-pillar vacuum line connector

A

- After removing lower A-pillar cover, vacuum line connector -2- becomes accessible at bottom of A-pillar.

1 - Boot

3 - Line to distribution box



57-45

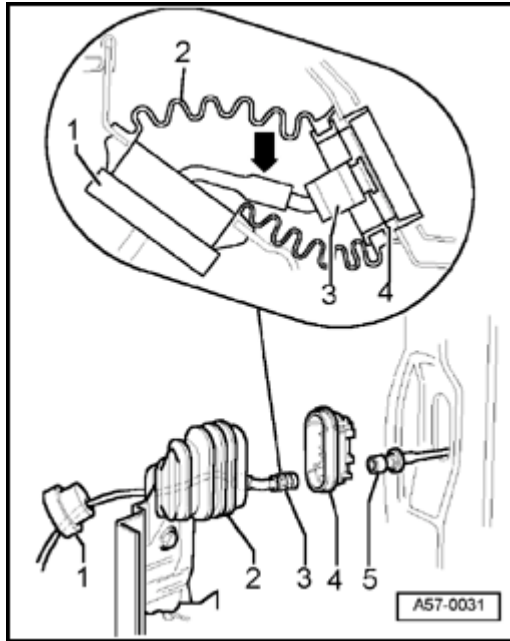
B-pillar vacuum line connector

4

- Assemble seal -1- with cable slot at bottom.
- After removing boot -2-, vacuum line connector -3- can be removed by disengaging locking mechanism from line -5-.

Note:

The 45° plug (arrow) must point toward front of vehicle.

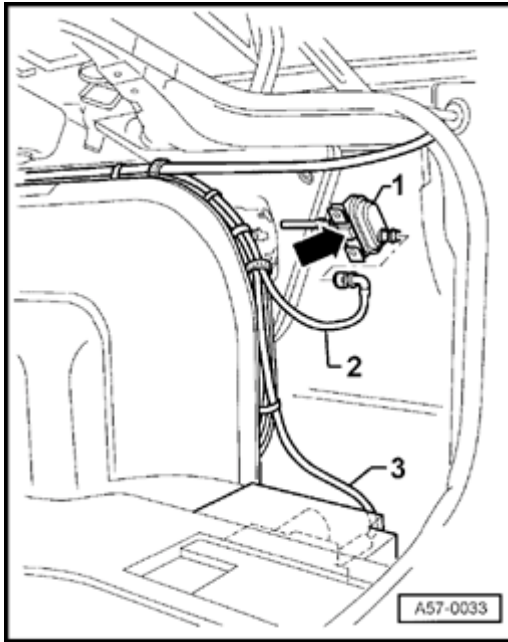


Lock actuator for fuel filling flap, removing and installing

A

- Disengage locking mechanism from angled plug and detach vacuum line -2-.
- To remove, press in locking lug arrow and pull lock actuator -1- rearward and out.

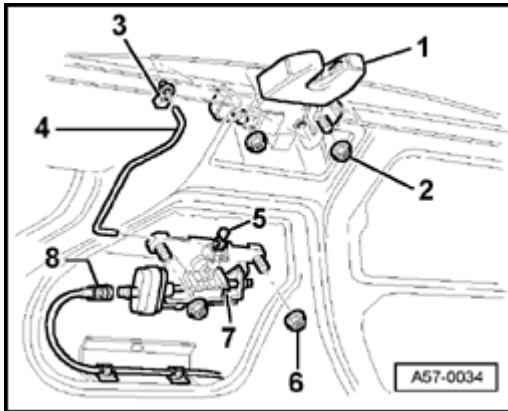
3 - Vacuum line to the pump for central locking system



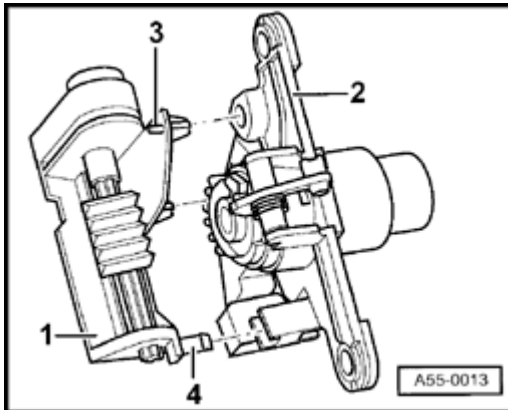
57-47

Rear lid lock actuator, removing and installing

Removing



- Separate harness connector and detach vacuum line.
- Disengage operating rod -4- from clip -3-.
- Remove hex nuts -6- and remove lock actuator -7- from rear lid lock.



- Push out retaining pin -3- (2x) remove expanding clip.
- Push clip -4- back and disconnect.
- Remove lock actuator -1- from rear lid lock.

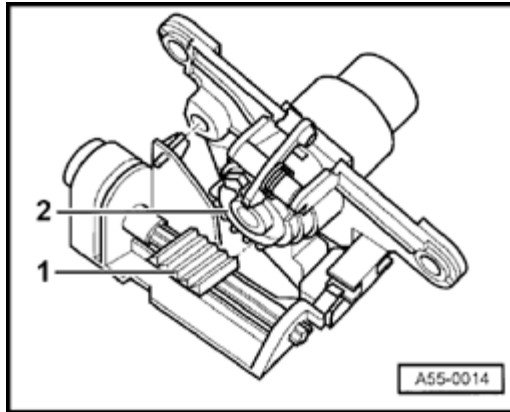
57-48

Installing

- Set lock cylinders in "open" position.

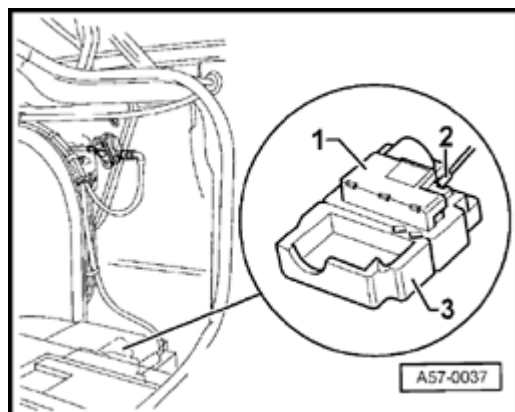
A

- Push ridged plate -1- to left. The first ridge of the plate -1- must snap into the first groove on the grooved segment -2-.



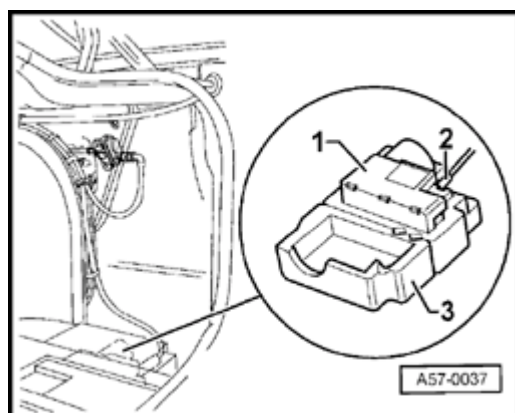
Central locking system pump, removing and installing

The pump for the central locking system is located in the right-rear of the luggage compartment under the luggage compartment trim.



A

- Fold back luggage compartment trim and remove insulation -3- with pump for central locking system -1-.
- Disengage connecting line -2-.



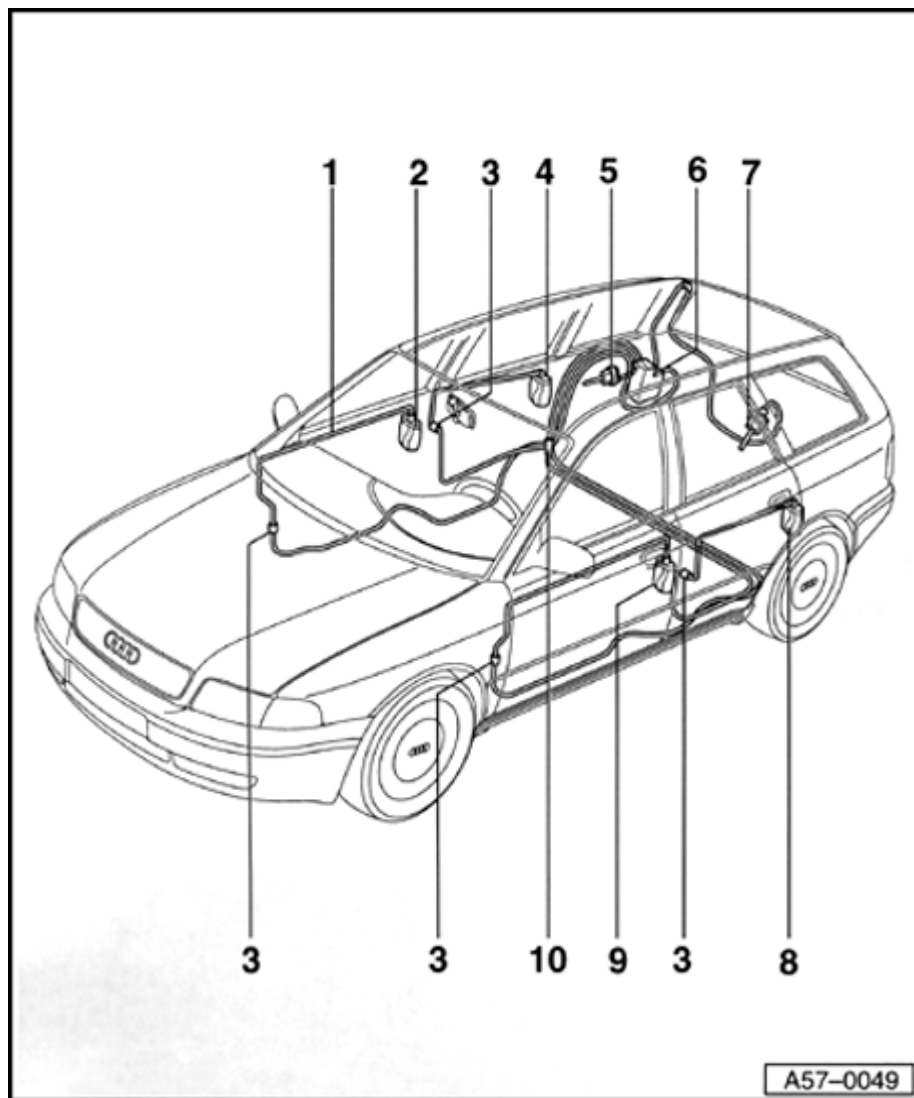
A

- Open insulation, disengage electrical harness connectors and remove connector -2- for vacuum line.

CAUTION!

After disconnecting all three connectors from the central locking system pump, ensure that the middle 6-pin connector (for power supply) is always plugged in last.

57-50



Central locking system (Avant), repairing

Assembly overview

1 - Pressure and vacuum lines

2 - Right-front door actuator valve

♦ Removing and installing ⇒ [page 57-12](#)

3 - Vacuum line connectors

♦ Disconnect vacuum line connectors ⇒ [page 57-42](#)

4 - Right-rear door actuator valve

♦ Removing and installing ⇒ [page 58-14](#)

5 - Fuel filling flap lock actuator

♦ Removing and installing ⇒ [page 57-52](#)

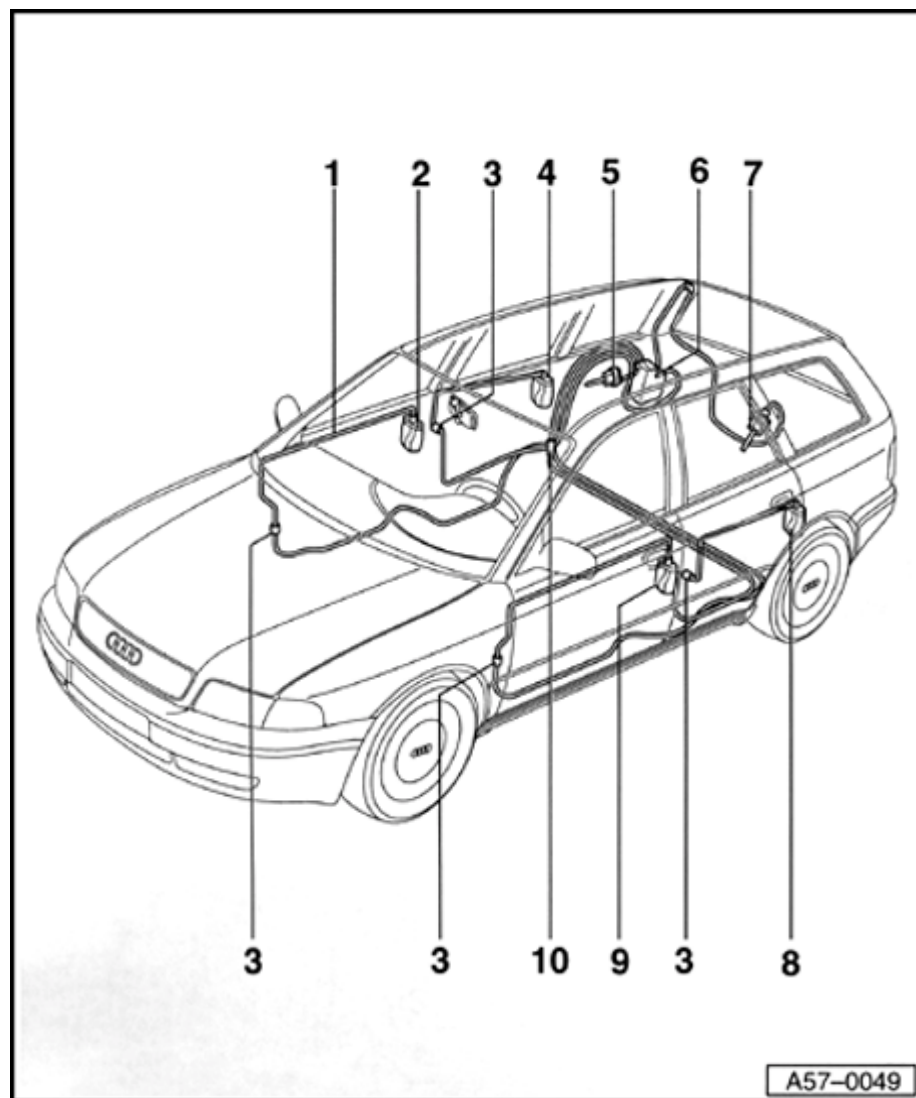
6 - Central locking system pump

♦ Removing and installing ⇒ [page 57-56](#)

7 - Rear lid lock actuator

♦ Removing and installing ⇒ [page 57-53](#)

57-51

**8 - Left-rear door actuator valve**

- ◆ Removing and installing same as for right door

9 - Left-front door lock actuator

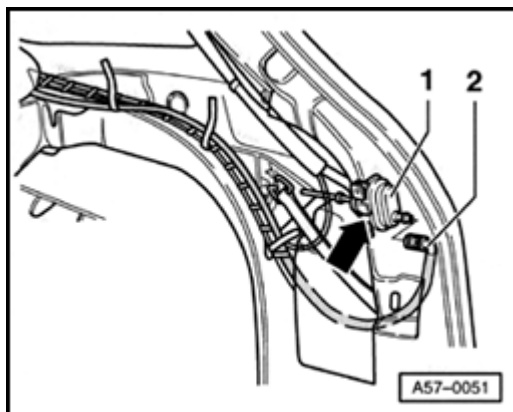
- ◆ Removing and installing same as for right door

10 - Distribution box

- ◆ Connected with all other vacuum lines, excluding lines for rear lid

57-52

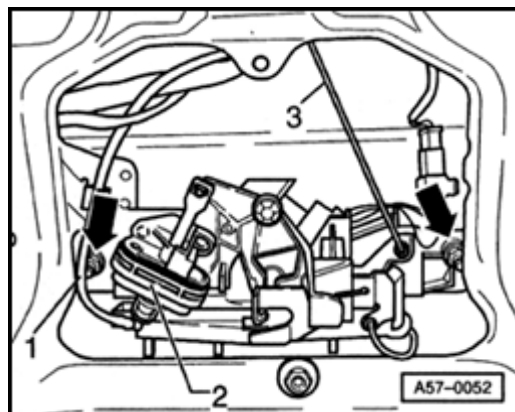
Fuel filling flap lock actuator, removing and installing

**A**

- Disengage locking mechanism from angled plug and detach vacuum line -2- from lock actuator -1-.
- To remove, press in locking lug (arrow) and pull lock actuator -1- rearward and out.
- To install, push into case until snap indicates engagement.

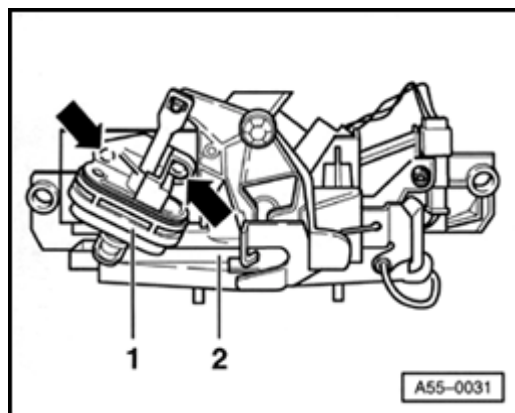
57-53

Rear lid lock actuator, removing and installing



A

- Remove tailgate trim ⇒ [page 57-54](#) .
- Disengage lock system at plug for vacuum line -1- and remove from lock actuator -2-.

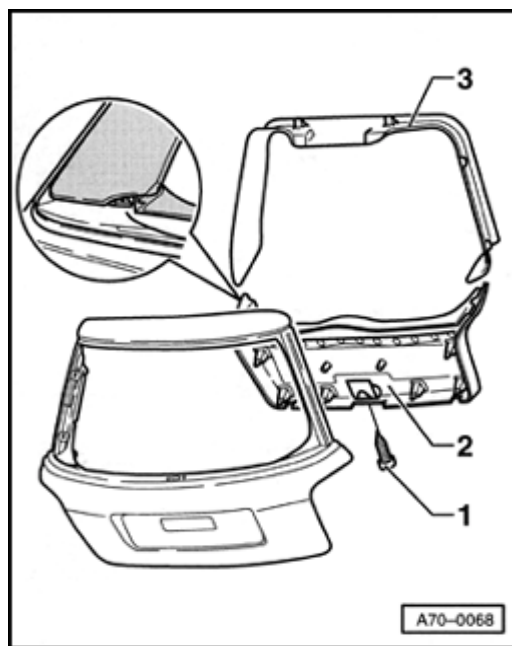


A

- Press clamping pins (arrow) out and remove lock actuator -1- from lock -2-.
- Clamping pins must be snapped back into expanding clips during installation.
- Pry out using screwdriver if necessary.

Note:

Illustration shows component after removal.



A

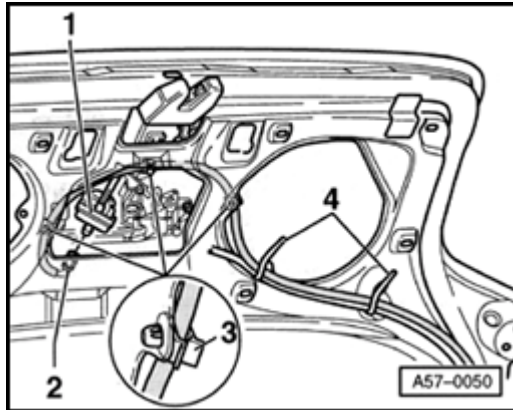
Fig. 1 Removing and installing tailgate trim

- Remove bolt -1- from handle well.
Torque: 1.5 Nm + 0.5 Nm (13 in. lb + 4 in. lb)
- Unclip lower rear hatch trim -2-.
- Unclip upper rear hatch trim -3-.

Note:

When installing the lower trim, guide bars must be inserted in upper trim.

57-55



A

Fig. 2 Line routing

- Route pressure and vacuum lines through tie wraps -4- as shown in diagram and snap into clips -3-.
- Snap harness connector -2- into lock actuator.

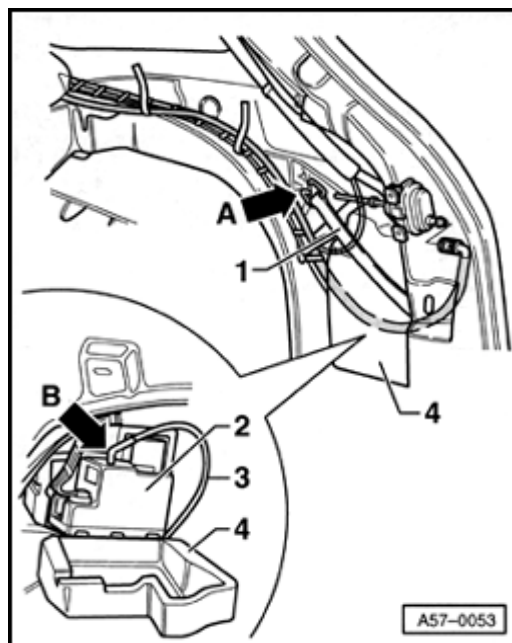
57-56

Central locking system pump, removing and installing

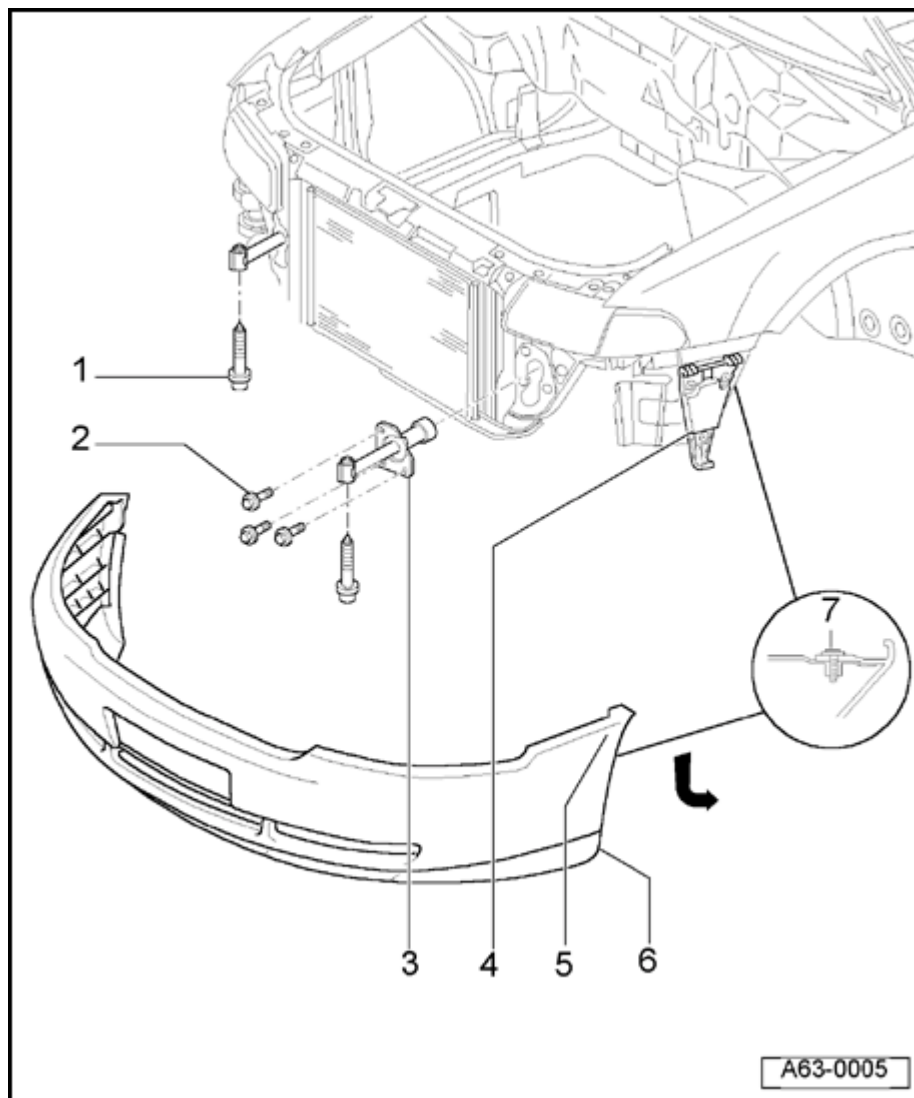
- Remove cover on side trim panel.
- Unhook tension strap -1- at arrow -A-.
- Remove insulation -4- with pump for central locking system -2- from side panel.
- Fold back insulation and remove pump.
- Disengage vacuum line connectors and detach angled plug (arrow B-).

CAUTION!

After disconnecting all three vacuum line connectors from the central locking system pump, ensure that the middle 6-pin harness connector (power supply) is always plugged in last.



63-1



Front bumper

Front bumper, removing, installing and assembly overview (➤ VIN 8D XA 200 000)

1 - Combination bolt

- ◆ 23 Nm (17 ft lb)

2 - Hex bolt

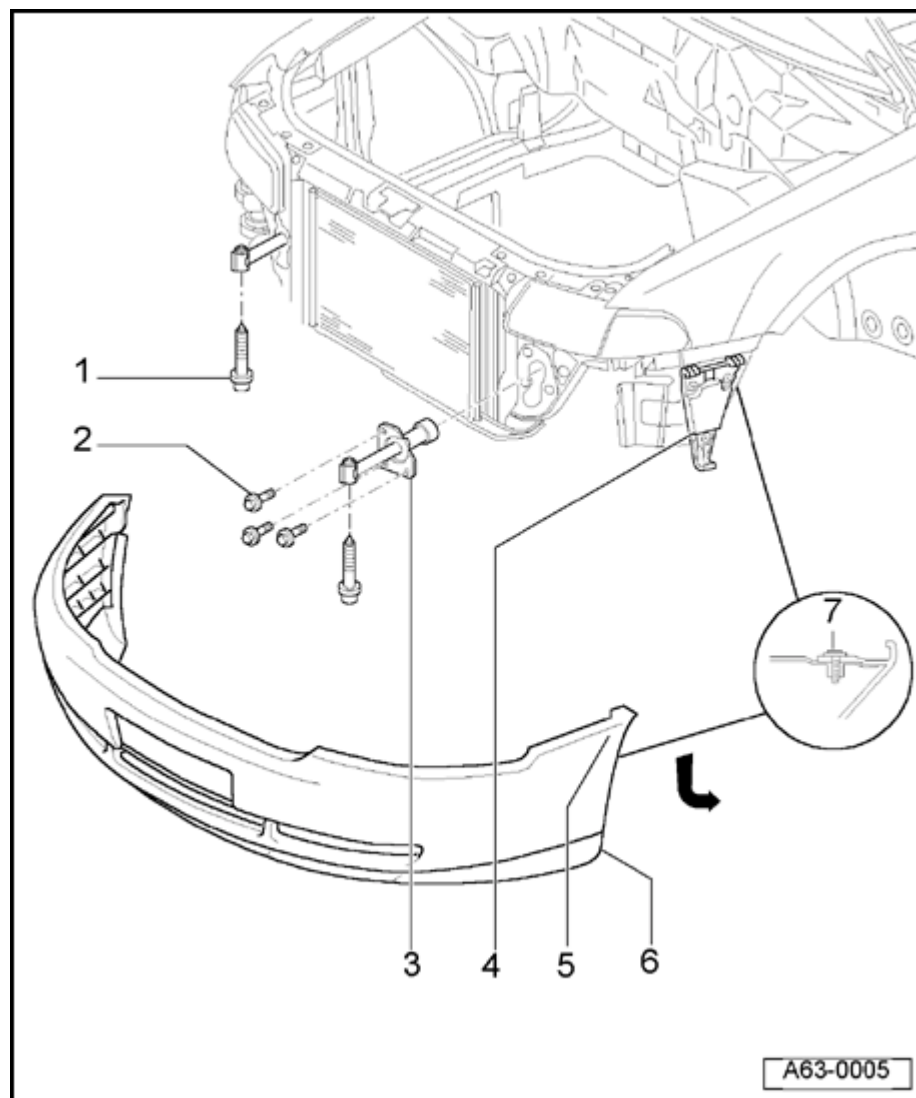
- ◆ 45 Nm (33 ft lb)
- ◆ Impact absorber is secured on right longmember with 4 hex bolts

3 - Impact absorber

- To remove, remove hex bolts and pull impact absorber out front.

4 - Bracket

- ◆ Removing and installing ⇒ [Fig. 2](#)



5 - Bumper

- To remove, remove Torx[®] screws at wheel housing liner.
- Remove air inlet grill at bumper.
- Remove combination bolts -1-.
- When installing, tighten to 23 Nm (17 ft lb).
- Unclip bumper from bracket -4- in direction of arrow and pull off towards front.

6 - Spoiler

- ◆ Removing and installing ⇒ [page 63-10](#)

7 - Torx[®] screw

- ◆ 1 Nm (9 in. lb)

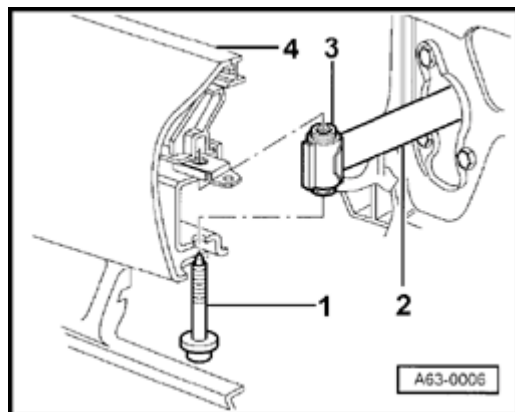


Fig. 1 Bumper height adjustment

- Bumper -4- height is adjusted by shifting threaded sleeve -3- in impact absorber -2-.
- Tighten combination bolt -1- to 23 Nm (17 ft lb).

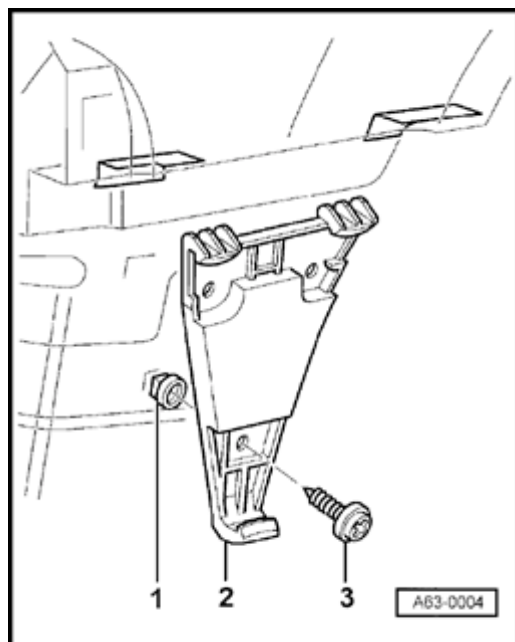
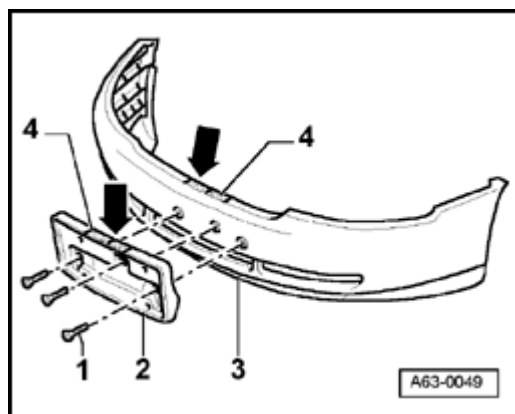


Fig. 2 Bumper bracket

- To remove, remove bolts -3- and take off bracket -2-.
- To assemble, press in clip -1-.

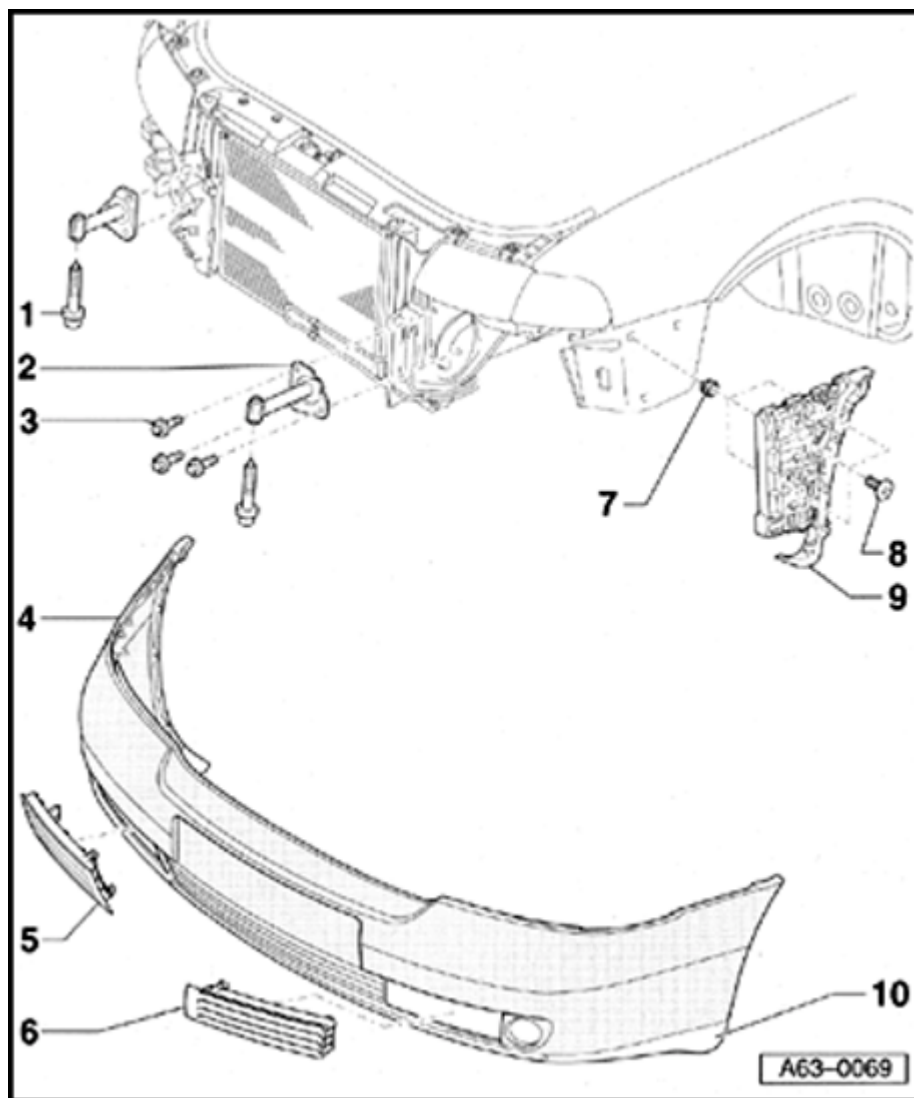


A

Fig. 3 Installing license plate holder**Note:**

Use license plate holder as a drill hole template.

- Open hood.
- Cover area in center of bumper and license plate holder with adhesive tape -4- as shown.
- Mark middle of bumper -3- and license plate holder -2- (arrows) on adhesive tape using fine felt tip pen.
- Slide license plate holder in one continuous motion from bottom to top of bumper in centered position.
- Mark holes on bumper.
- Using drill (8 mm - 10 mm), drill holes centered around marks through bumper cover.
- Secure license plate holder -2- on bumper -3- using bolts -1-.



Front bumper, removing and installing (VIN 8D XA 200 001 ➤)

1 - Bolt w/washer assembly

- ◆ 23 Nm

2 - Impact absorber

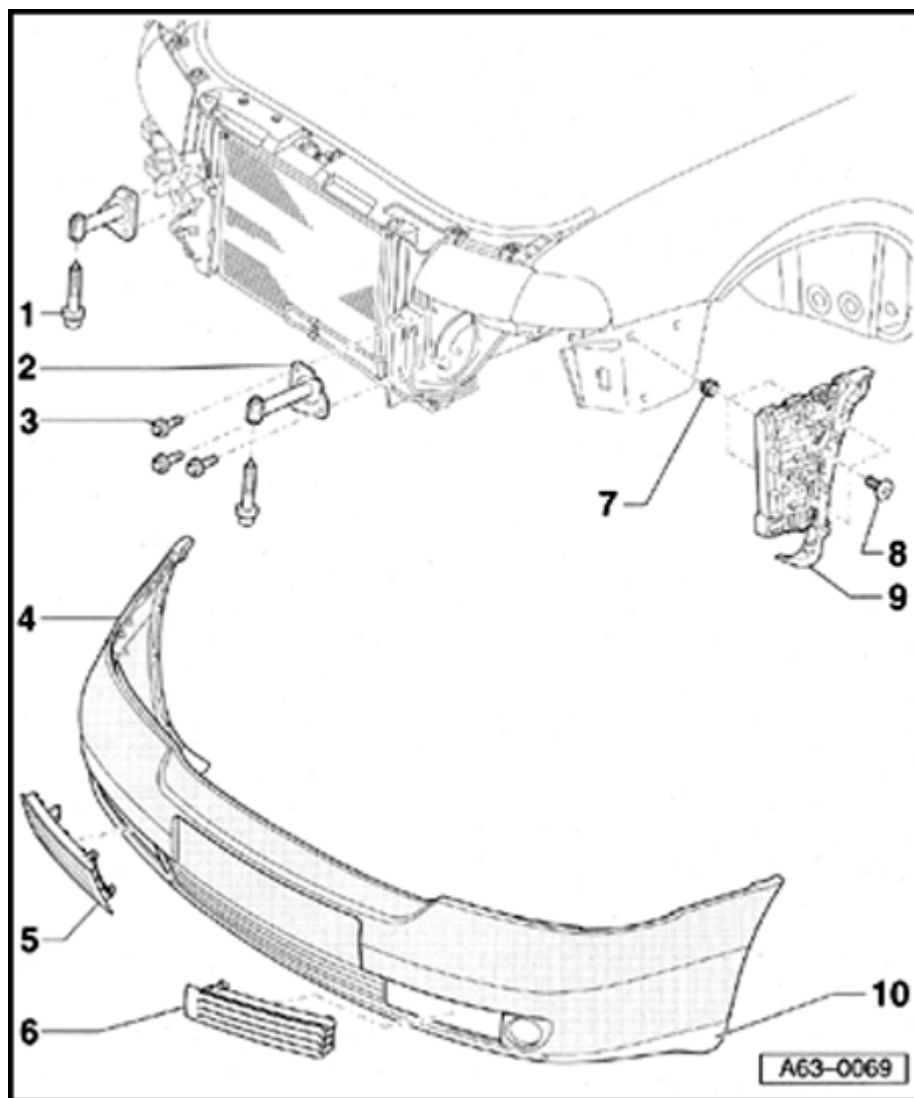
- ◆ To remove, remove hex bolts and pull impact absorber out front.

3 - Hex bolt.

- ◆ 45 Nm
- ◆ Impact absorber is secured on right longmember with 4 hex bolts.

4 - Bumper

- ◆ To remove, remove Torx screws at wheel housing liner.
- ◆ Remove air inlet grill at bumper.
- ◆ Remove bolt w/washer assembly -1-.
- ◆ When installing, tighten to 23 Nm.
- ◆ Unclip bumper from bracket -9- and remove toward front.

**5 - Air inlet grill, right**

◆ Removing and installing ⇒ [page 63-7](#) .

6 - Air inlet grill, left

◆ Removing and installing same as for air inlet grill, right.

7 - Clip

◆ To install, press into fender.

8 - Combination bolt

◆ 1.5 Nm.

◆ Tighten bolts at top rear, top front, and at bottom in specified sequence when installing bracket.

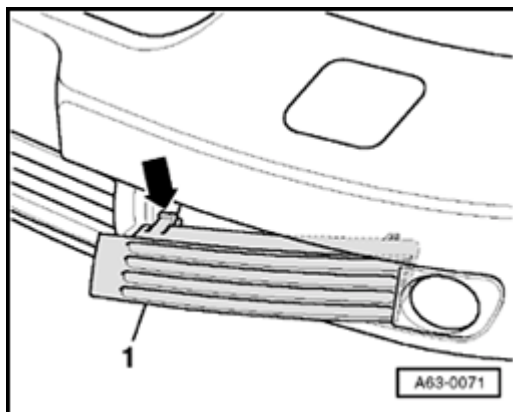
9 - Bracket

◆ Removing and installing ⇒ [page 63-8](#) .

10 - Spoiler

◆ Removing and installing ⇒ [page 63-10](#) .

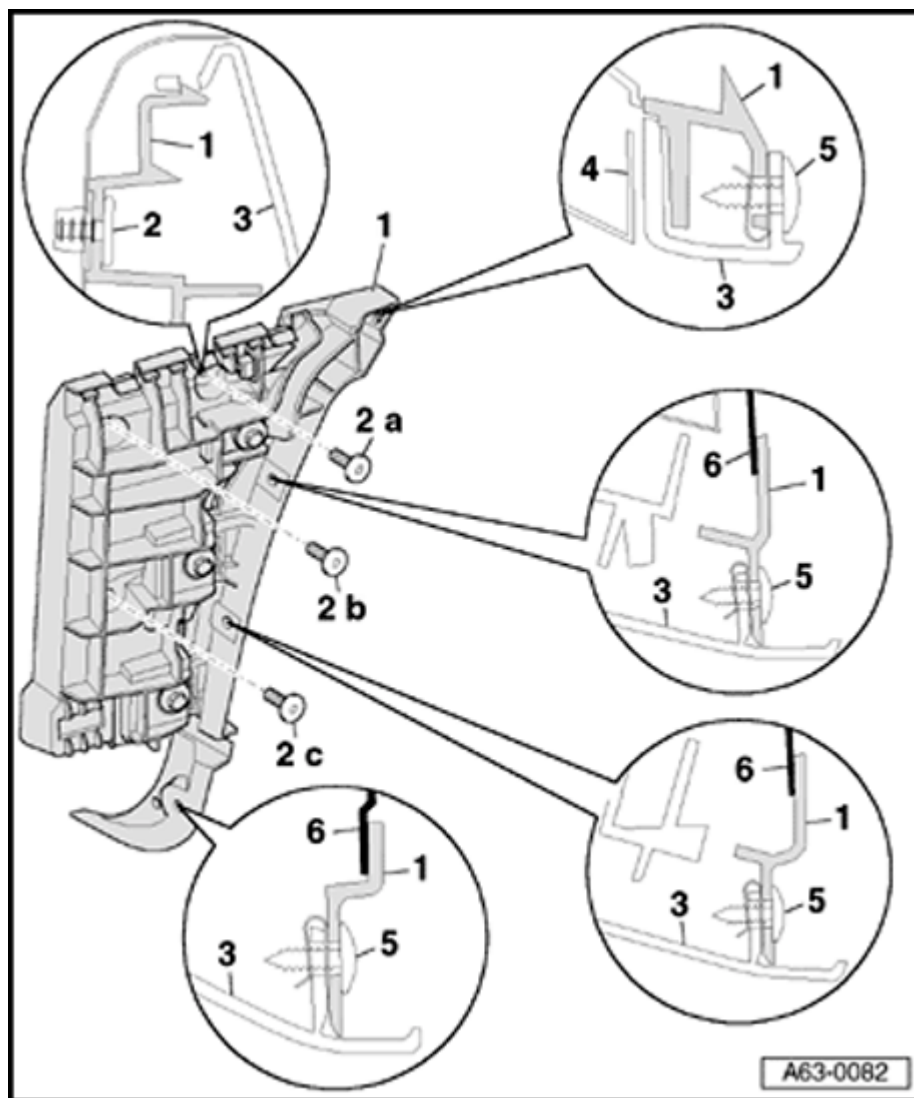
63-7



A

Fig. 1 Removing and installing air inlet grill

- Disengage retaining tabs at top and bottom using screwdriver (arrow).
- Remove inner end of air inlet grill first.



Bracket for front bumper, removing and installing

1 - Bracket for front bumper

- ◆ The bracket has two parts. The rear half can be shifted to adjust the length.

2 - Combination bolts

- ◆ 1.5 Nm
- ◆ Tighten bolts in sequence: -a-, -b- then -c-.

3 - Bumper

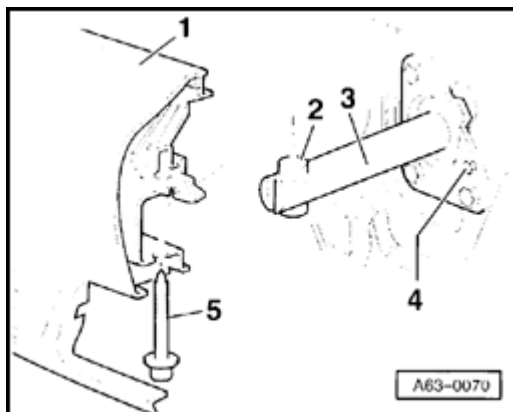
- ◆ Removing and installing ⇒ [page 63-5](#) .

4 - Fender

5 - Metal bolt

- ◆ 1.5 Nm.

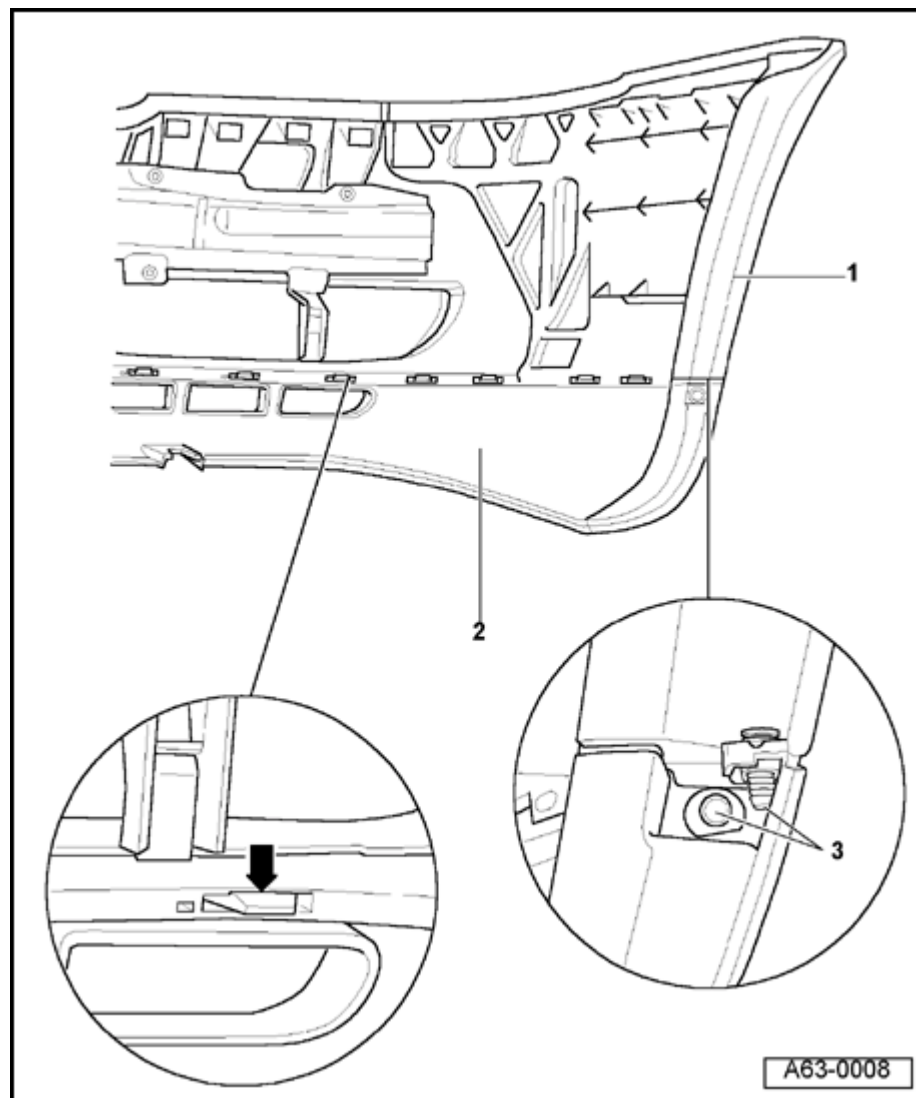
6 - Wheelhousing liner



4

Fig. 1 Front bumper height adjustment

- Bumper -1- height is adjusted by shifting the threaded sleeve -2- in the impact absorber -3-.
- Tighten combination bolt to 23 Nm when installing bumper.
- Bolt -4- is for securing the impact absorber to the lock carrier, e.g. for service position.
- Tightening torque 4 Nm



Spoiler, removing and installing

1 - Bumper

- ◆ Remove before detaching spoiler

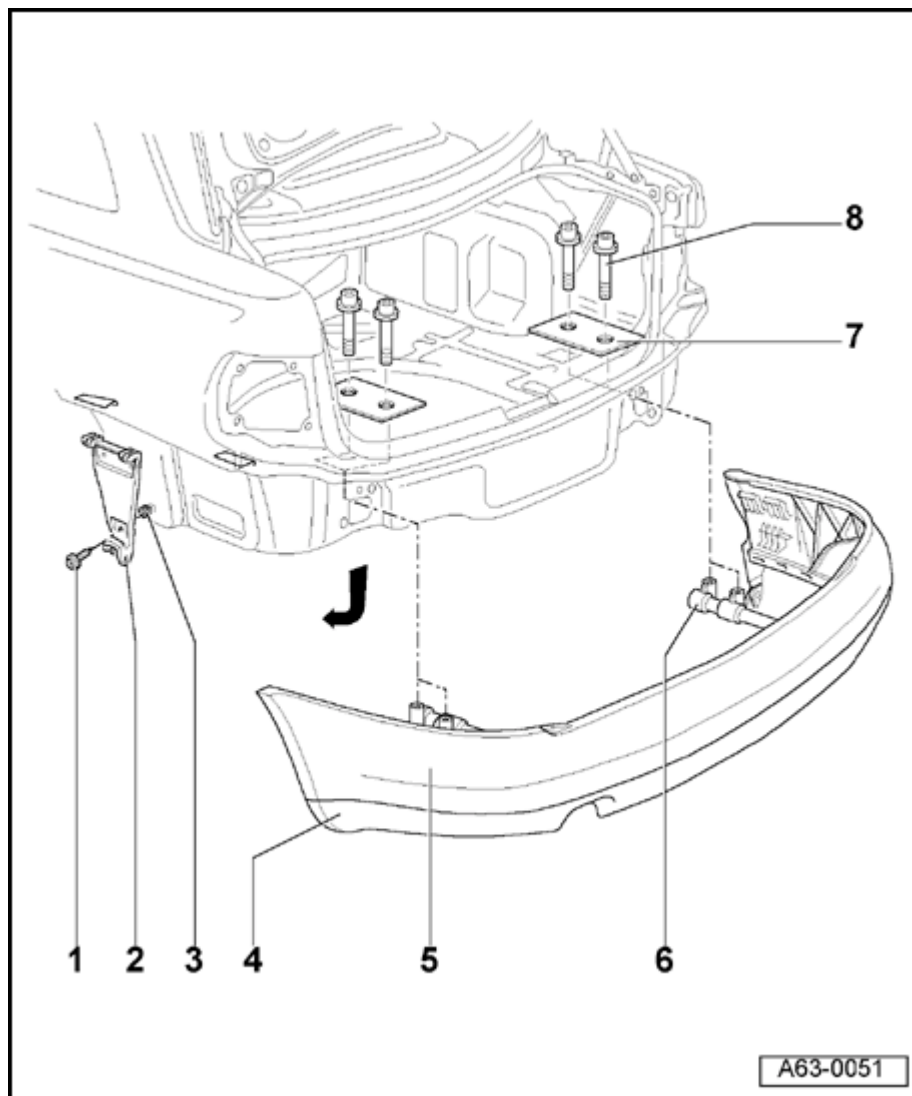
2 - Spoiler

- To remove, take out expanding clips -3- on both sides.
- Unclip retaining tabs (arrow) from spoiler and remove spoiler from bumper.

3 - Expanding clip

- To remove, pull pins out and pry out expanding clips.

63-11



Rear bumper (Sedan)

Rear bumper, removing and installing (➤ VIN 8D XA 200 000)

1 - Metal bolt

2 - Bracket

- To remove, remove metal bolts -1- and take off bracket.

3 - Clip

4 - Spoiler

◆ Removing and installing ⇒ [page 63-10](#)

5 - Bumper

- To remove, unscrew combination bolts -8-.

- Unclip bumper from bracket -2- in direction of arrow and pull off towards rear.

6 - Impact absorber

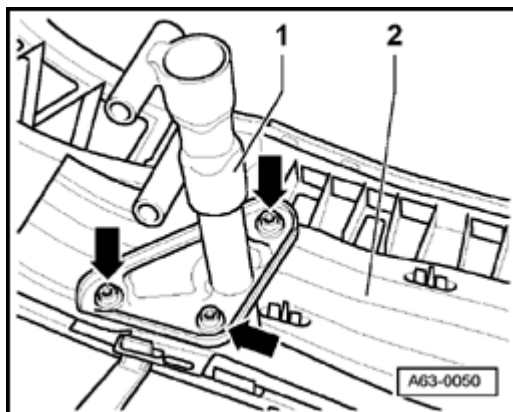
◆ Removing from bumper ⇒ [Fig. 1](#)

7 - Strengthening plate

8 - Combination bolt

◆ 23 Nm (17 ft lb)

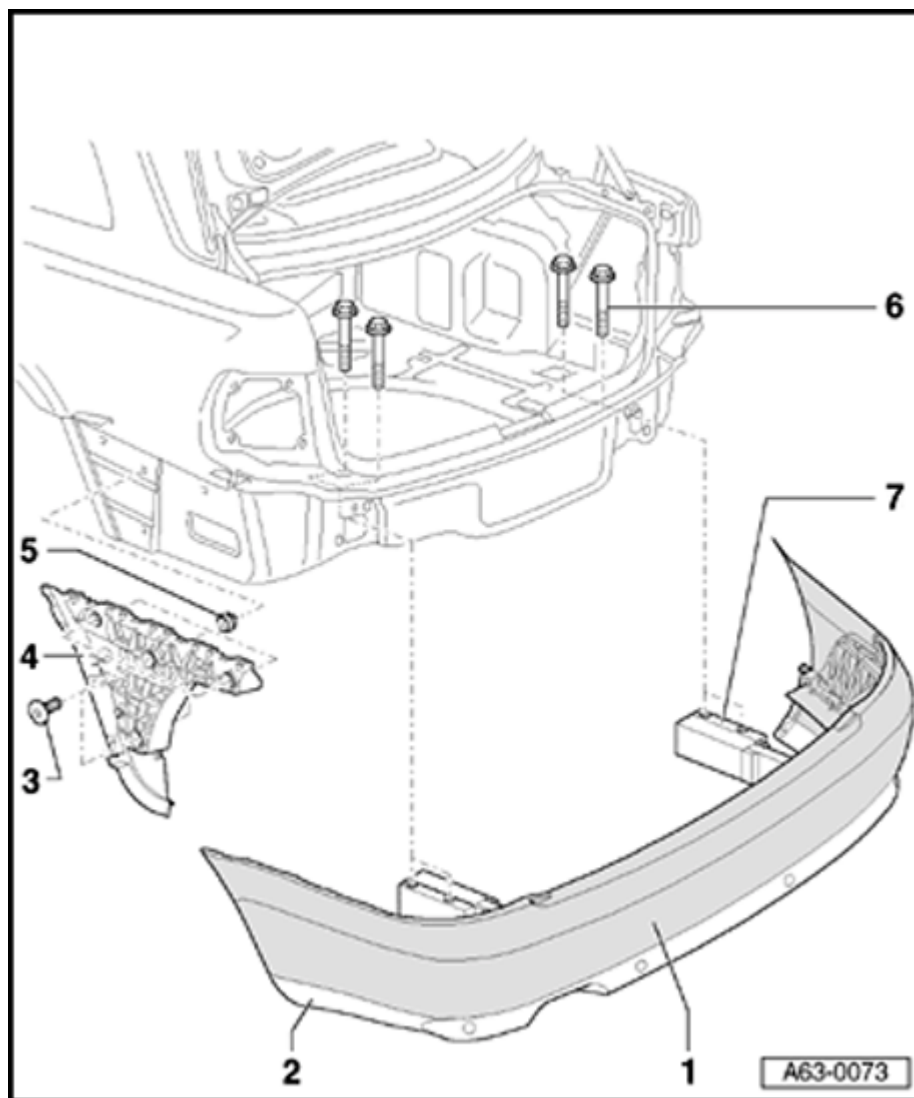
63-12



A

Fig. 1 Removing impact absorber from bumper

- Remove bolts (arrows) and take impact absorber -1- out of bumper -2-.
- When installing, tighten to 23 Nm (17 ft lb).



Rear bumper, removing and installing (VIN 8D XA 200 001 ➤)

1 - Bumper

- ◆ To remove, remove combination bolts -6-.
- ◆ For S4 models, an additional bolt must be installed at the wheelhousing liner ⇒ [Fig. 1](#).
- ◆ Unclip bumper from bracket -4- and remove toward rear.

2 - Spoiler

- ◆ Removing and installing ⇒ [page 63-10](#).

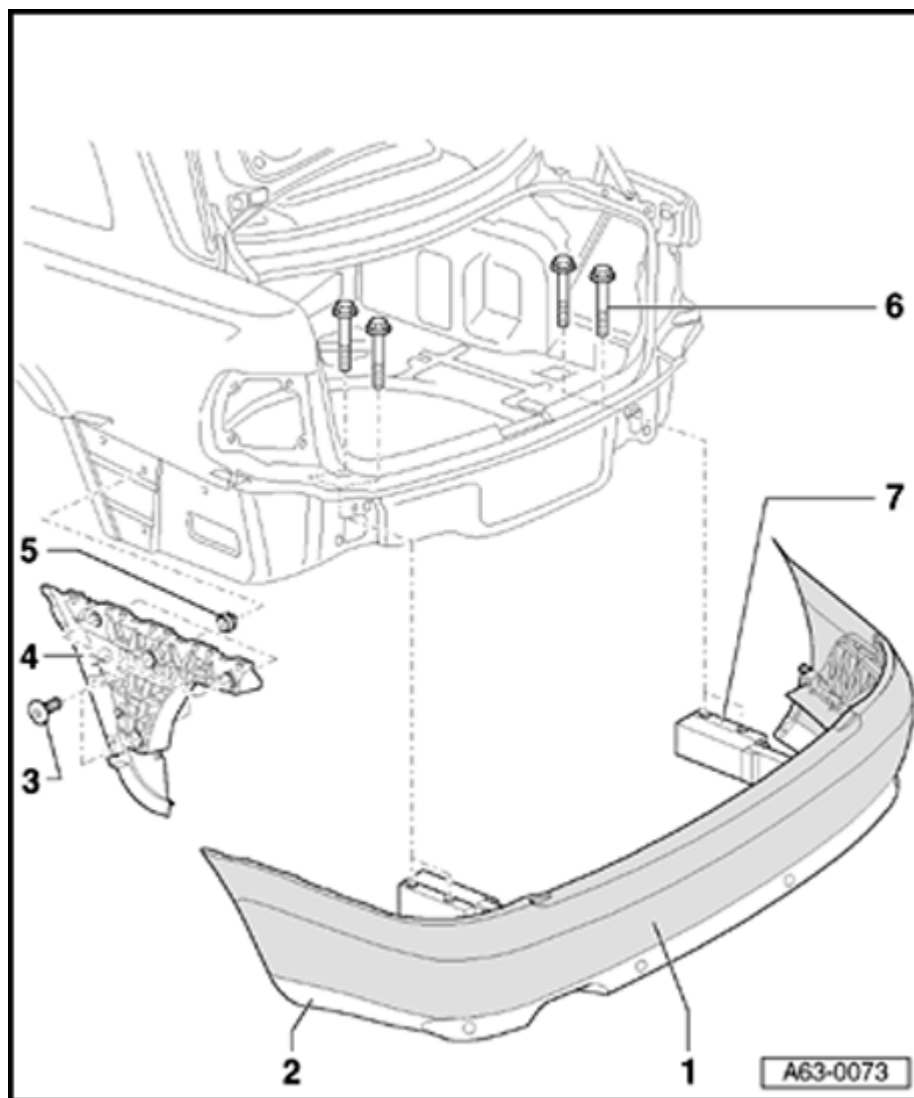
3 - Metal bolt

- ◆ 1.5 Nm.

4 - Bracket for rear bumper

- ◆ The bracket has two parts. The front half can be shifted to adjust the length.

63-14

**5 - Clip**

- ◆ To install, press into fender.

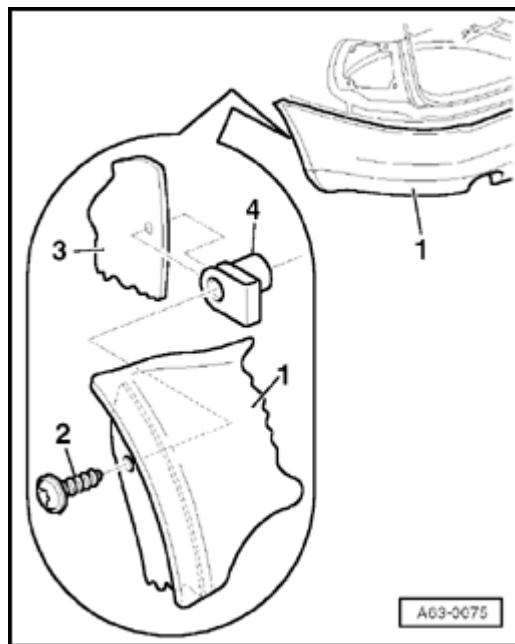
6 - Combination bolt

- ◆ 23 Nm

7 - Impact absorber

- ◆ Removing from bumper ⇒ [Fig. 2](#) .

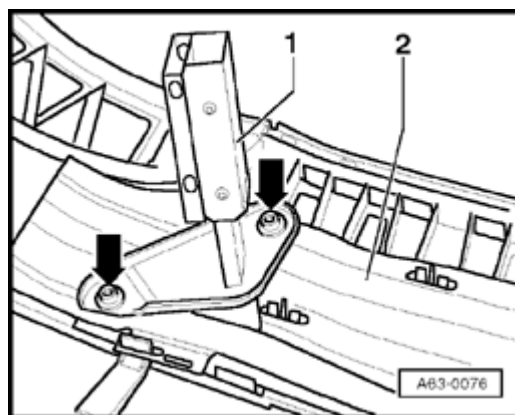
63-15



A

Fig. 1 Additional mount for S4

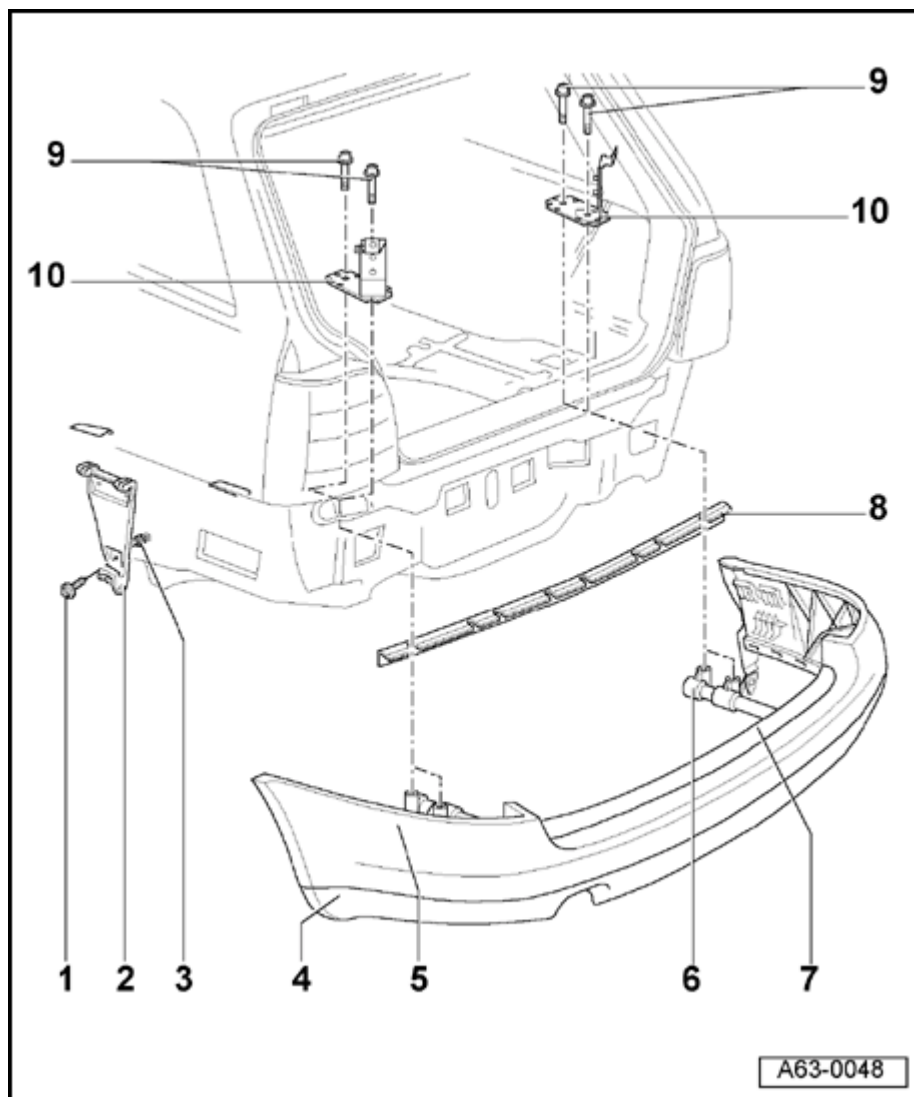
- Remove bolt -2- from wheelhousing liner before disassembling bumper -1-.
- Clip -4- is clipped onto wheelhousing liner -3-.



A

Fig. 2 Removing impact absorber from bumper

- Remove bolts (arrows) and take impact absorber -1- out of bumper -2-.
- When installing, tighten to 23 Nm.



Rear bumper (Avant)

Rear bumper, removing, installing and assembly overview (➤ VIN 8D XA 200 000)

1 - Metal bolt

2 - Bracket

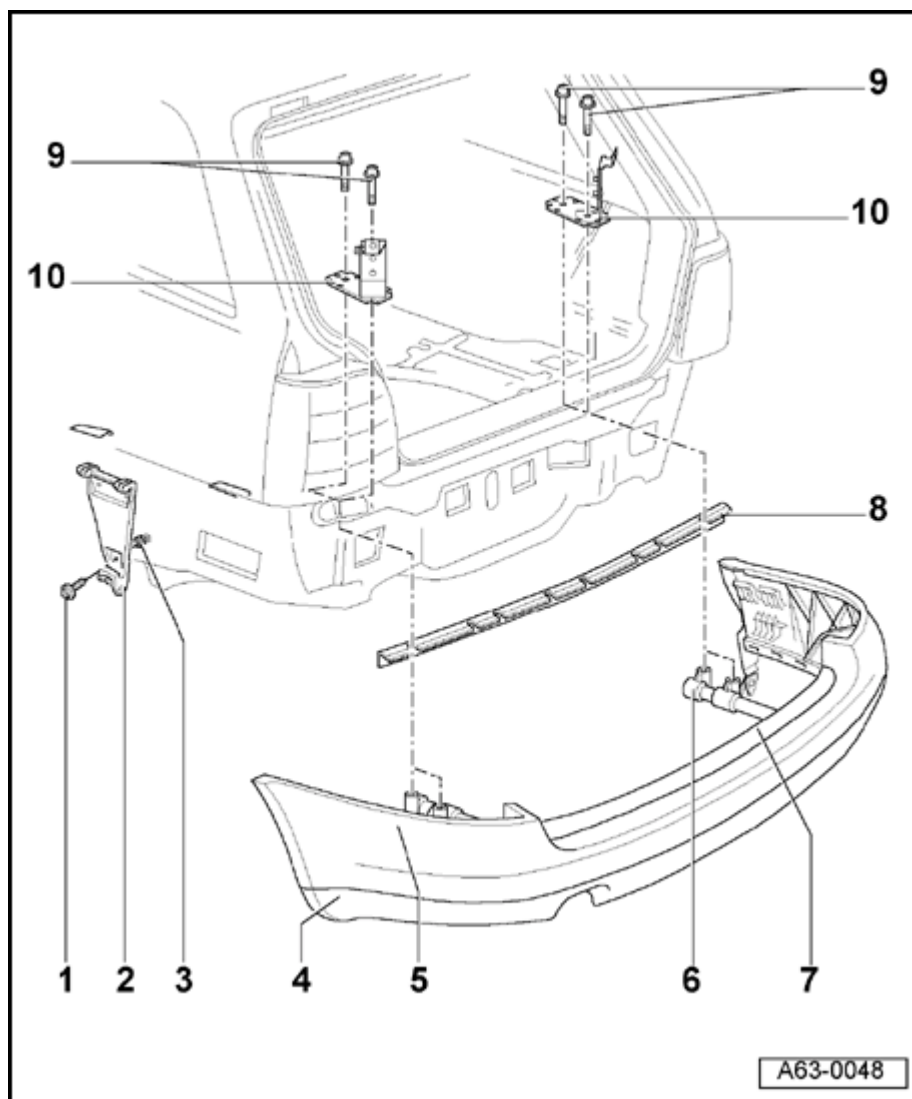
- To remove, remove metal bolts -1- and take off bracket.

3 - Clip

4 - Spoiler

◆ Removing and installing ⇒ [page 63-10](#)

63-17



5 - Bumper

- Before removing, remove rear panel trim.

⇒ [Repair Manual, Body-Interior, Repair Group 70](#)

- Remove tailgate seal in area of loading edge/side panels.
- Fold luggage compartment cover forward.
- Remove tie-downs left and right at side trim and unclip rear side trim.

⇒ [Repair Manual, Body-Interior, Repair Group 70](#)

- Carefully pull side trim at left and right towards vehicle interior.
- Remove combination bolts -9-.
- Unclip bumper from bracket -2- in direction of arrow and pull off towards rear.

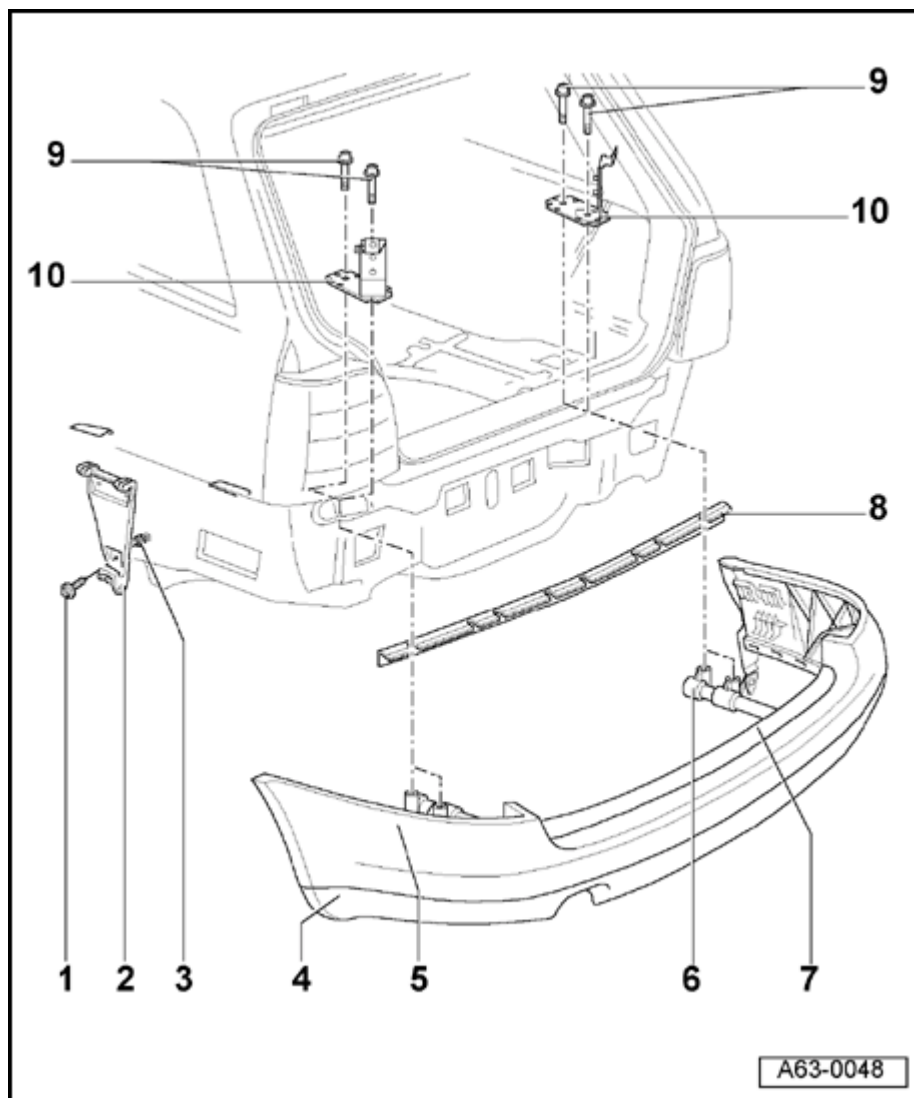
6 - Bracket

- ◆ Removing from bumper ⇒ [page 63-19](#)

7 - Cover strip

- ◆ Removing ⇒ [page 63-19](#)

63-18

**8 - Support**

- To remove, heat body with heat gun to approx. 40 °C (104 °F) and pull off support.

- To attach, heat body in adhesion area with hot air injector to approx. 40 °C (104 °F).

◆ Adhesion surface must be free of dust and grease

- Pull off protective foil and press on support using special tool 3356 (application roller).

9 - Combination bolt

◆ 23 Nm (17 ft lb)

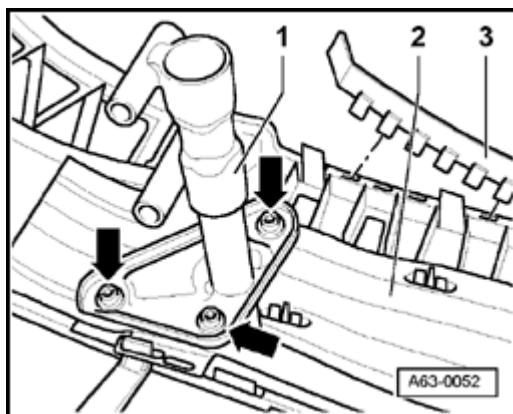
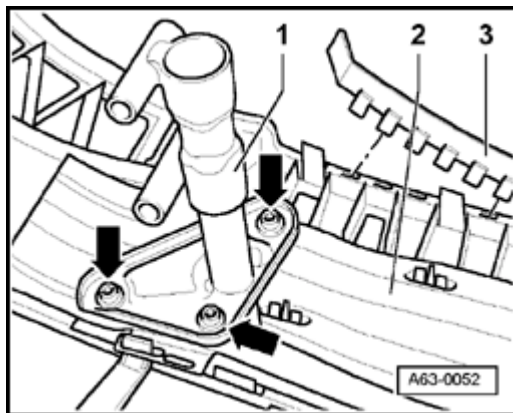
10 - Console

Bumper cover strip, removing

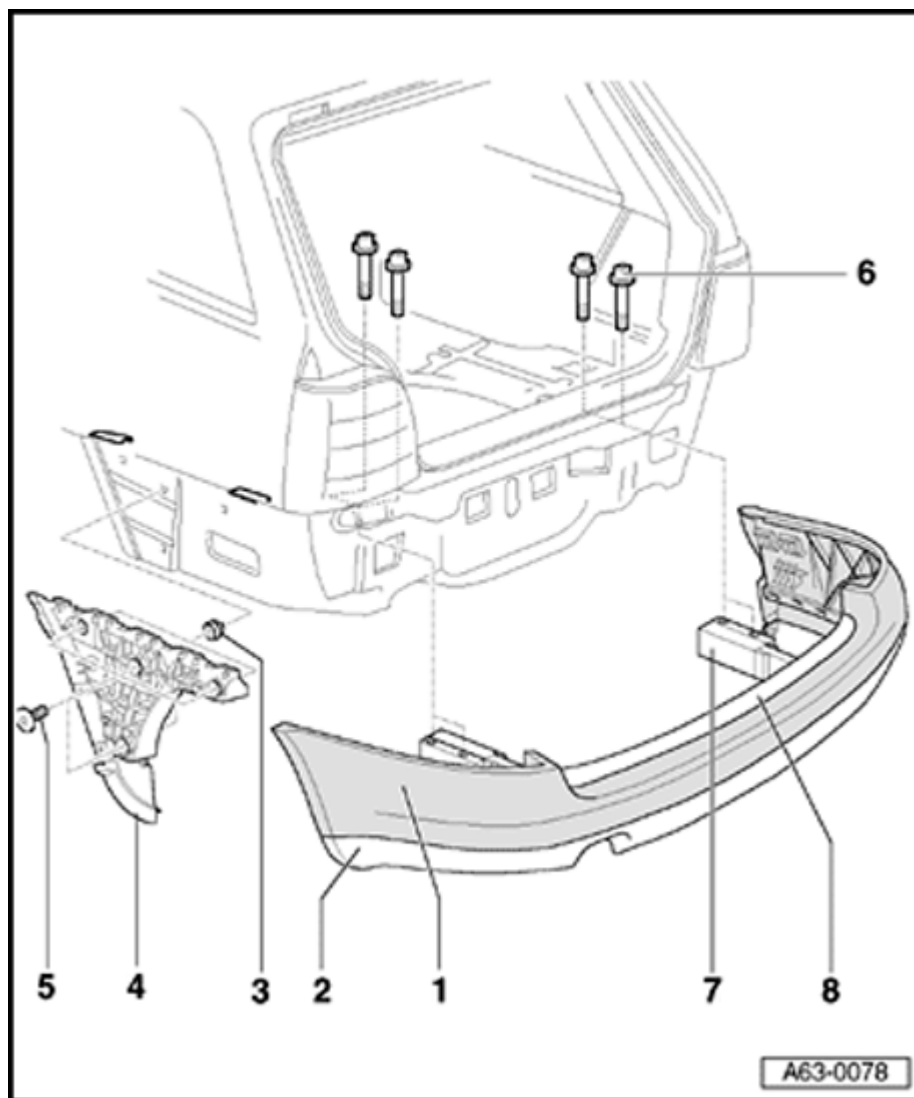
- Remove bumper ⇒ [page 63-1](#) .
- Release locking mechanism and unclip cover strip -3- from bumper -2-.

Removing bracket from bumper

- Remove bolts (arrows) and take bracket -1- out of bumper -2-.
- Tightening torque: 23 Nm (17 ft lb)



63-20



Rear bumper, removing and installing (VIN 8D XA 200 001 ➤)

1 - Bumper

- ◆ Before removing, remove rear panel trim.

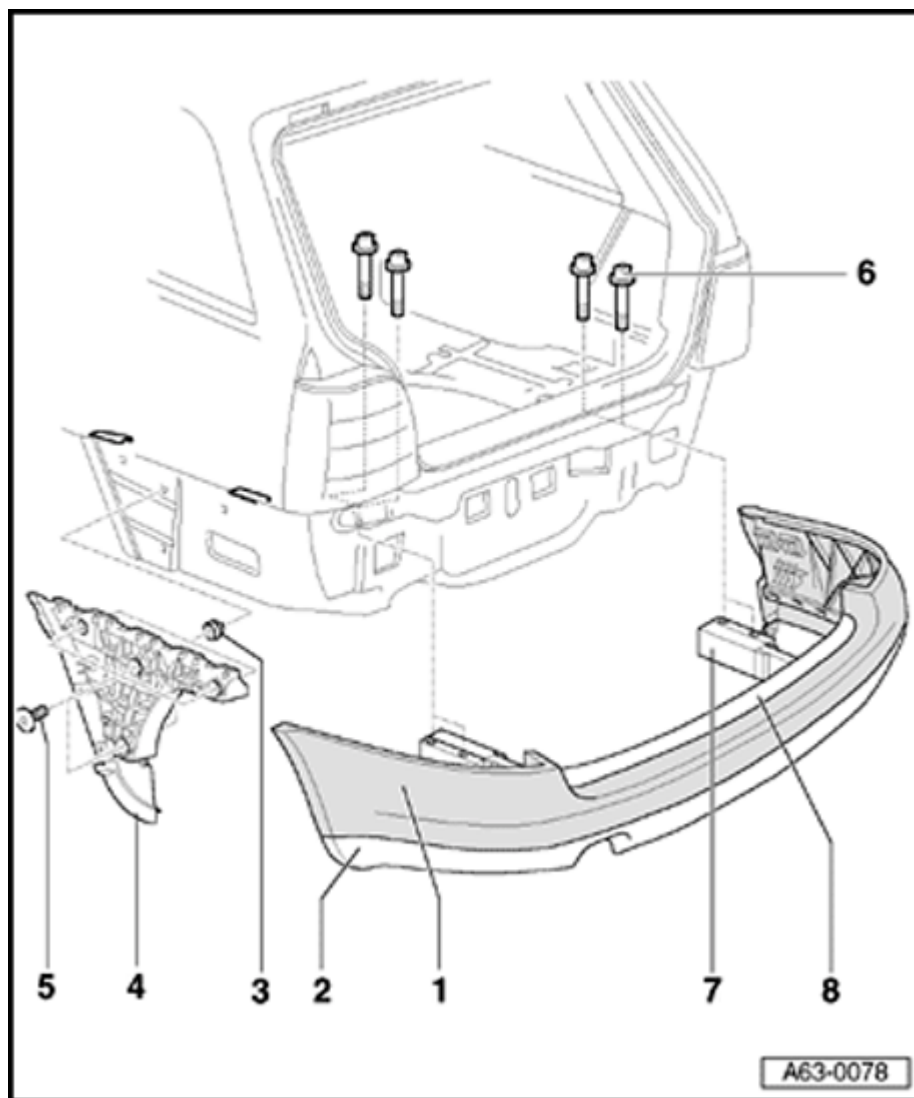
⇒ *Repair Manual, Body-Exterior, Repair Group 70, trim pieces.*

- ◆ Remove rear lid seal around loading edge and sides.
- ◆ Fold luggage compartment cover forward.
- ◆ Remove tie-downs left and right at side trim and unclip rear side trim.

⇒ *Repair Manual, Body-Exterior, Repair Group 70, trim pieces.*

- ◆ Carefully pull side trim at left and right toward vehicle interior.
- ◆ Remove screw w/washer assembly -6-.
- ◆ Unclip bumper from bracket -4- and remove toward rear.

63-21

**2 - Spoiler**

◆ Removing and installing ⇒ [page 63-10](#) .

3 - Clip**4 - Bracket**

◆ To remove, remove metal bolts -5- and remove bracket -2-.

5 - Metal bolt**6 - Screw w/washer assembly**

◆ 23 Nm

7 - Bracket

◆ Removing from bumper ⇒ [page 63-22](#) .

8 - Cover strip

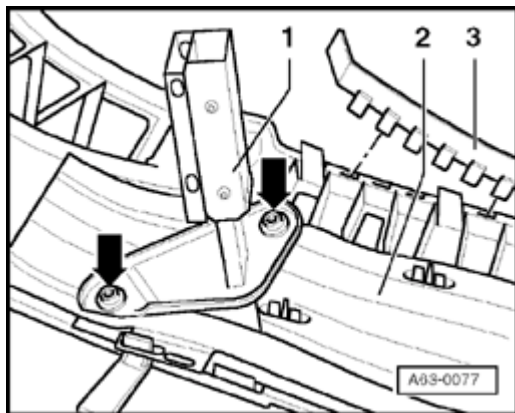
◆ Removing ⇒ [page 63-22](#) .

Bumper cover strip, removing

- Remove rear bumper ⇒ [page 63-20](#) .

4

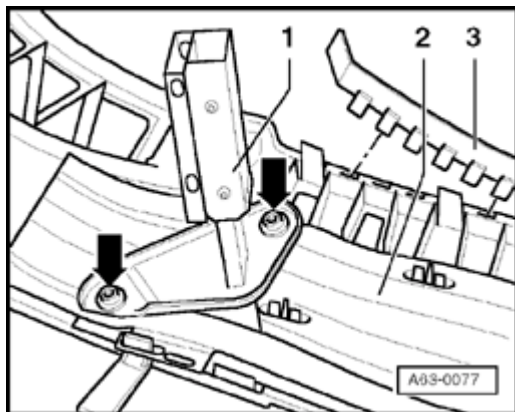
- Release locking mechanism and unclip cover strip -3- from bumper -2-.
- for removing impact absorber.

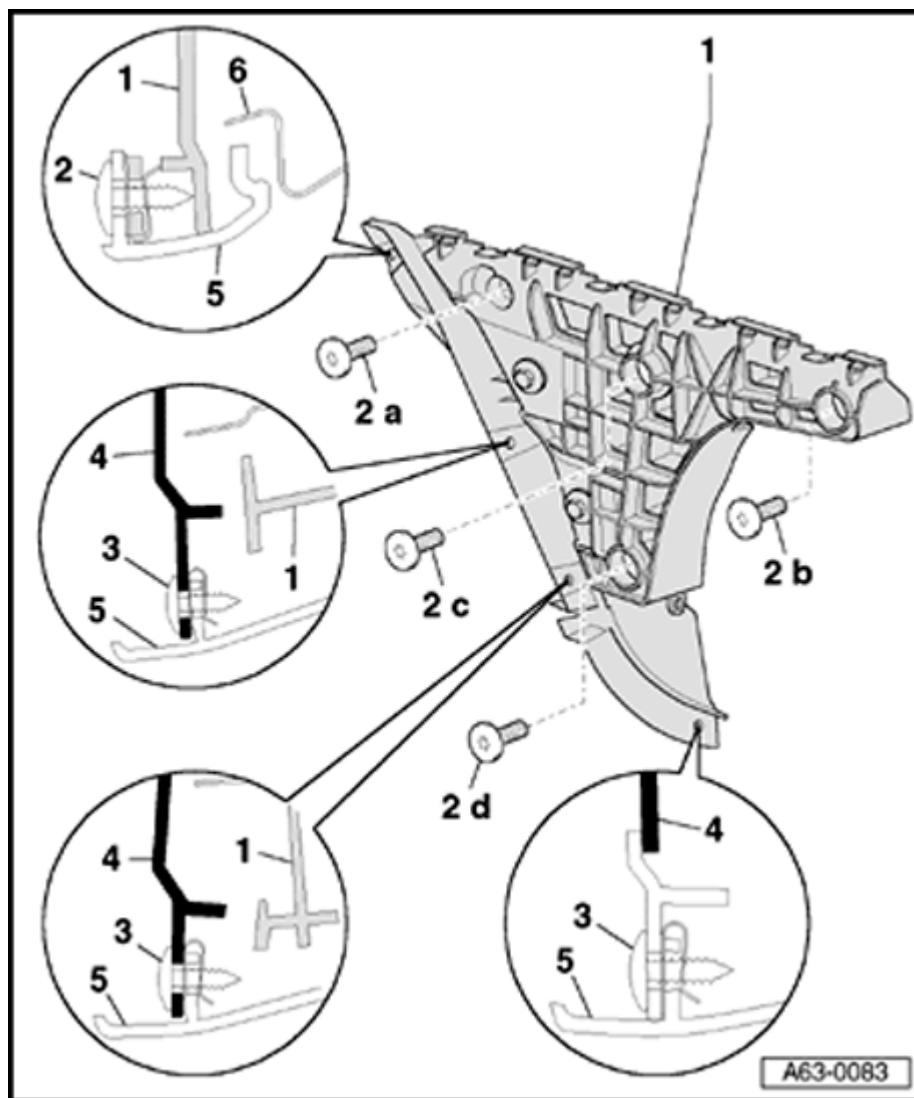


4

Fig. 1 Removing bracket from bumper

- Remove bolts (arrows) and take bracket -1- out of bumper -2-.
- Installation tightening torque 23 Nm.





Bracket for rear bumper, removing and installing

1 - Bracket for rear bumper

- ◆ The bracket has two parts. The front half can be shifted to adjust the length.

2 - Combination bolts

- ◆ 1.5 Nm.
- ◆ Tighten bolts in sequence -a-, -b-, -c- then -d-.

3 - Metal bolt

- ◆ 1.5 Nm.

4 - Wheelhousing liner, rear

5 - Rear bumper

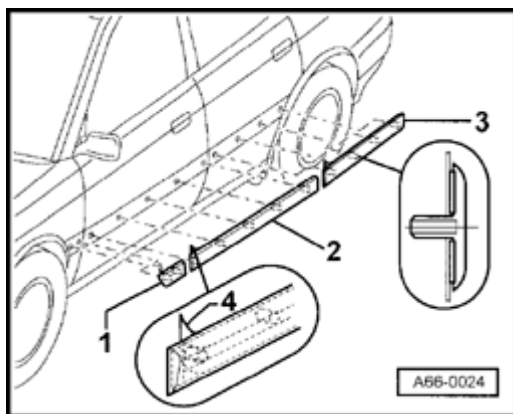
- ◆ Removing and installing ⇒ [page 63-20](#) .

Protective trim moldings

Protective trim moldings, removing and installing

Note:

Protective trim moldings cannot be removed without destroying them.



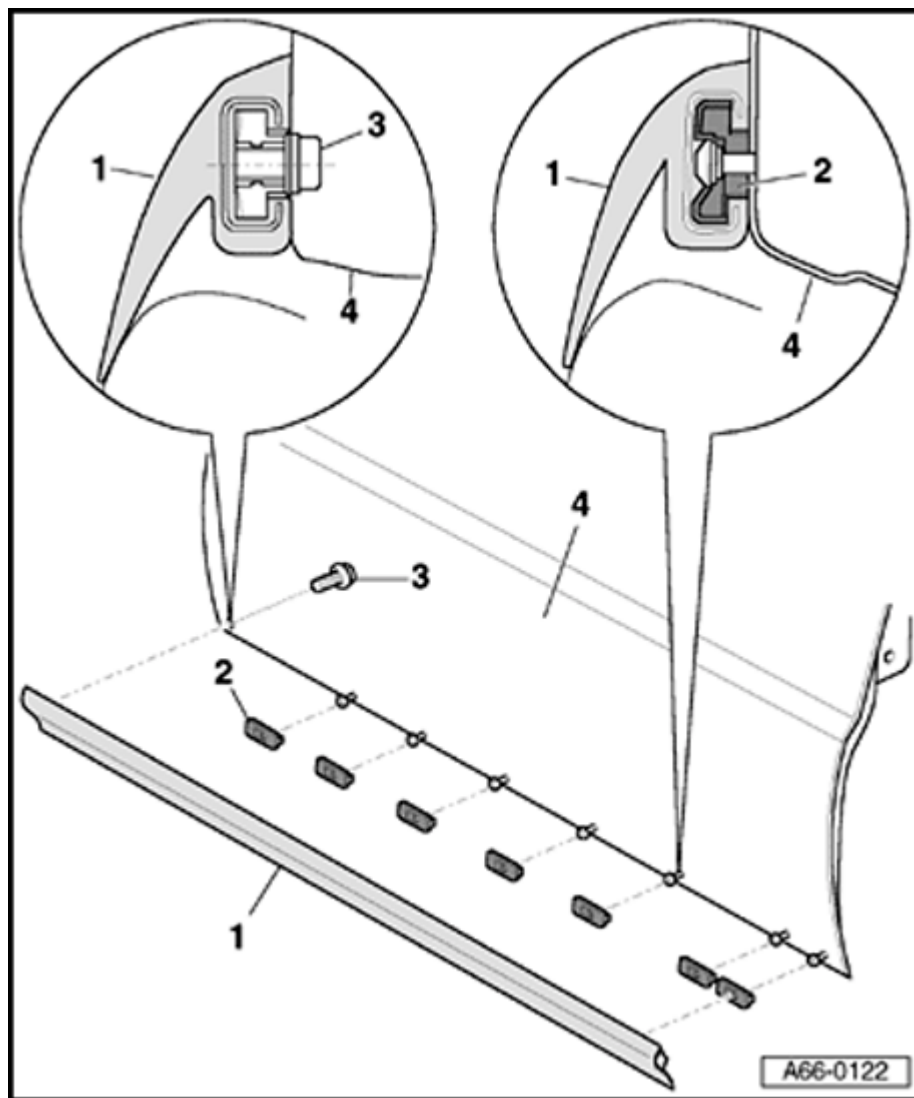
- Make sure all bonding surfaces are free of dust and grease.

Protective trim moldings must only be installed at room temperature. Vehicle and protective trim molding (to be installed) must be left at room temperature for at least 2 hours before treating.

- Pull off backing sheet -4- shortly before installing.

Protective trim molding must be installed within 90 minutes after backing sheet has been removed.

- Position protective trim moldings -1-, -2-, or -3- at front with guide stud and bond toward rear.
- Apply pressure of 100 N/cm to protective trim moldings by pressing against or using roller.
- Vehicle must remain at room temperature for 4 hours (minimum) after installing moldings.



Lower trim strip for front door

Lower trim strip, removing and installing

1 - Lower trim strip

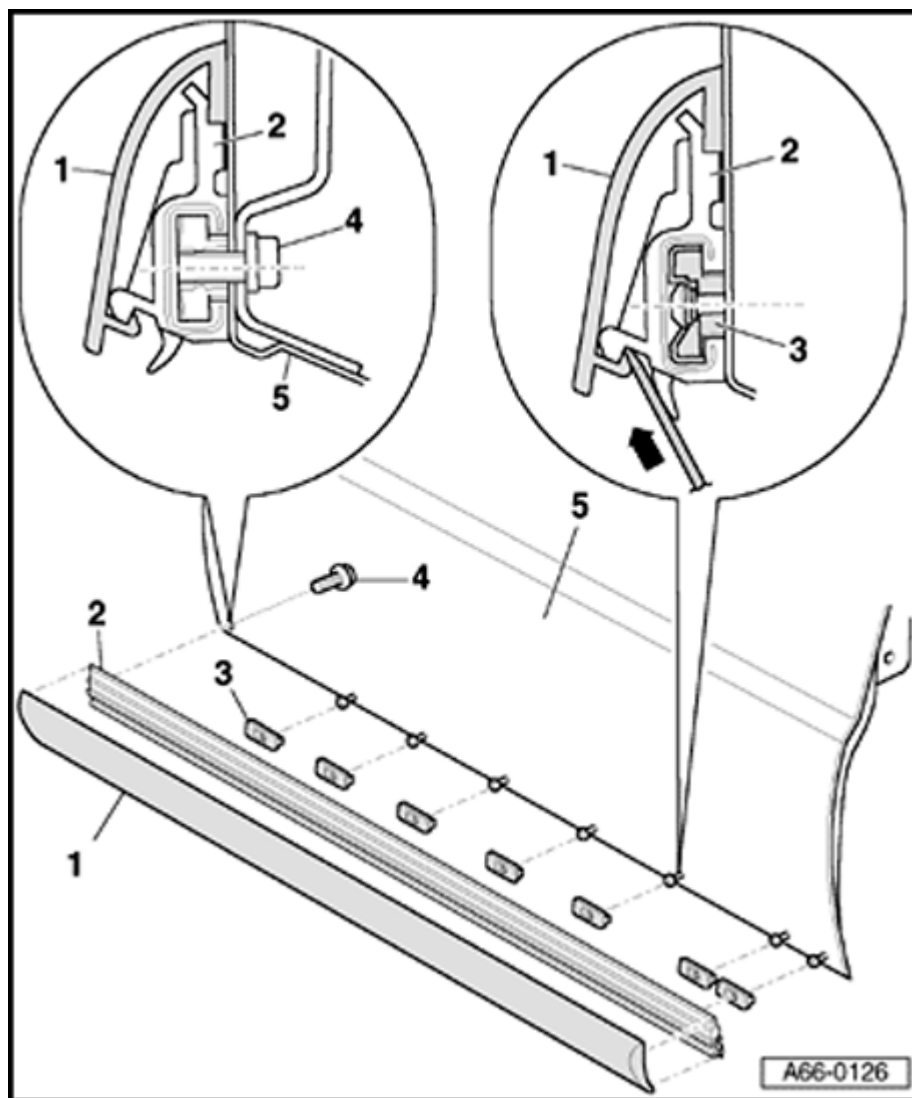
- ◆ Remove combination bolt -3- and slide trim strip toward rear out of retaining clips -2-.
- ◆ Remove trim strip laterally from door.
- ◆ Installation is the reverse of removal.

2 - Retaining clip

3 - Combination bolt

- ◆ 1 Nm

4 - Front door



Lower trim strip, removing and installing (S4)

1 - Lower trim strip

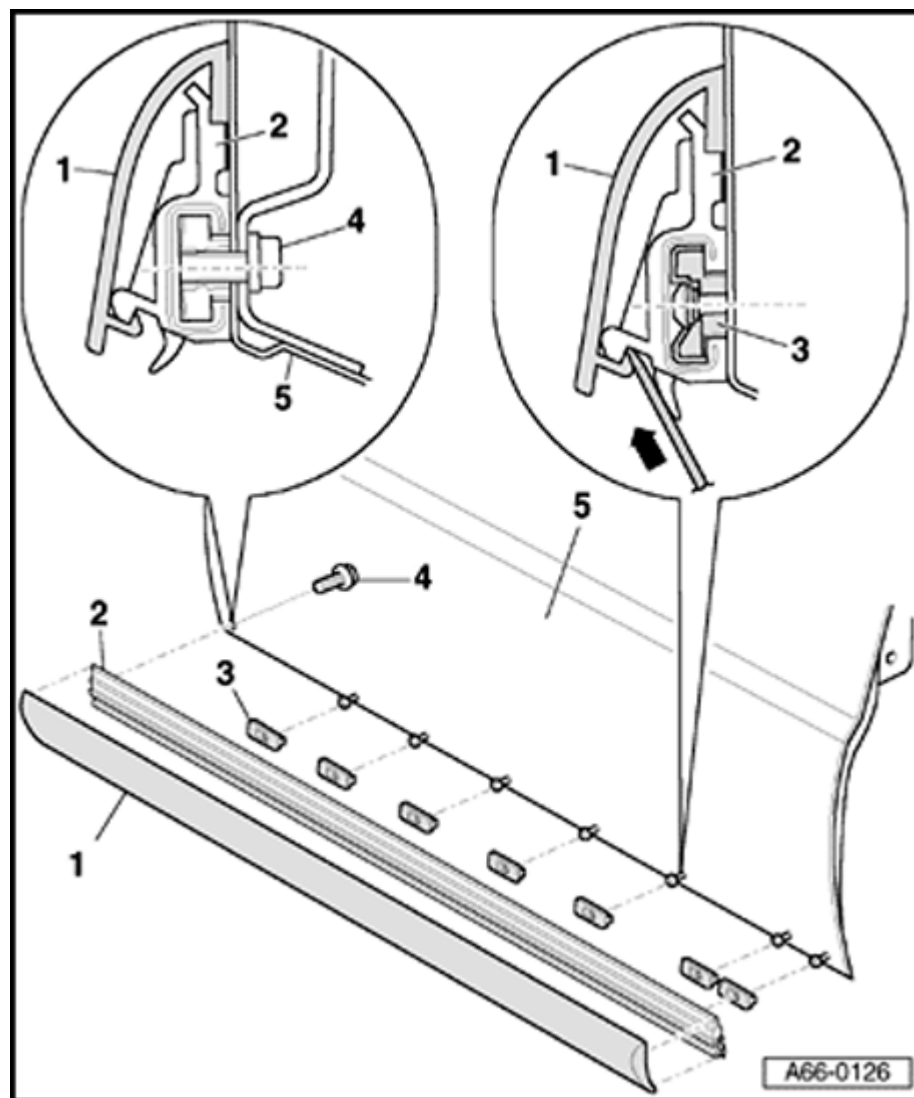
◆ Removing:

- Use screwdriver to gradually press tab on retaining strip upward and out of trim strip in direction of arrow.
- Pull trim strip to side out of retaining strip during this process.

◆ Installing:

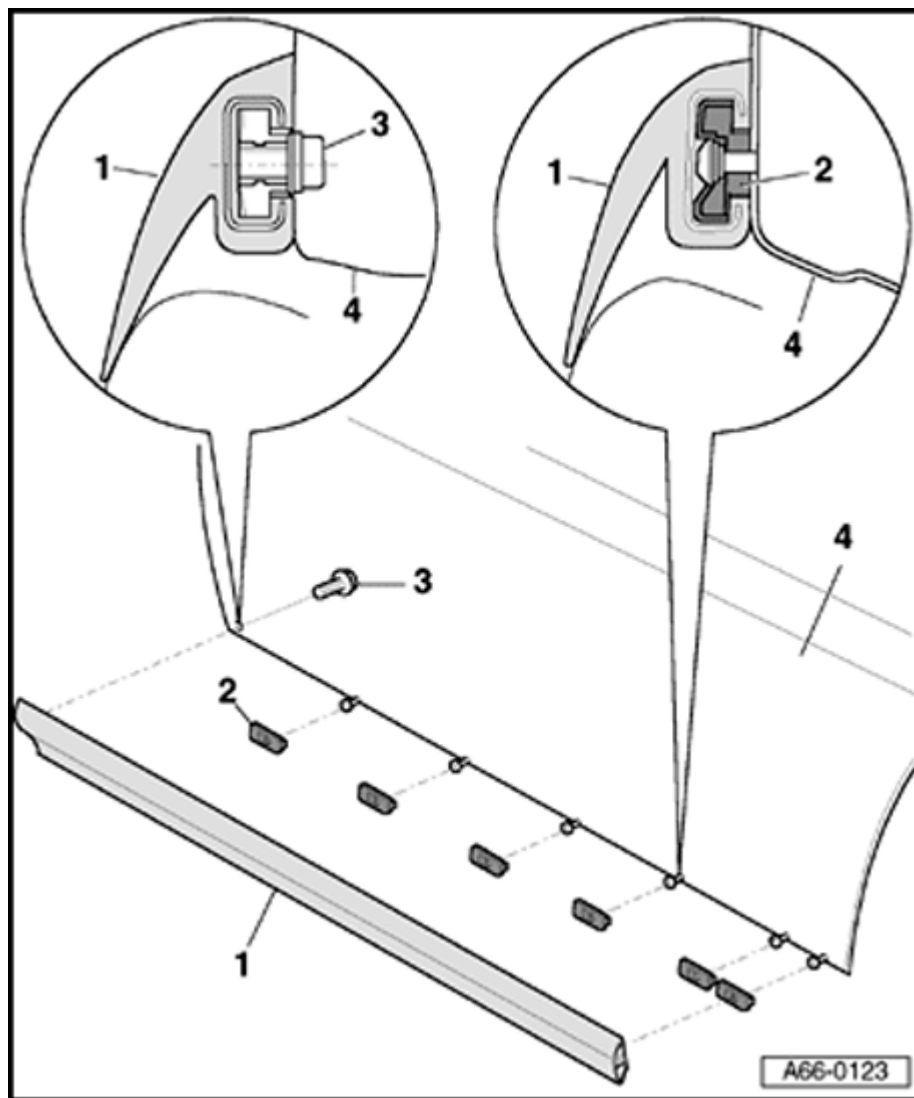
- Align trim strip and place onto retaining strip from top to bottom.
- Press lower trim strip onto retaining strip from side.

66-4

**2 - Retaining strip****3 - Retaining clip****4 - Combination bolt**

◆ 1 Nm

5 - Front door



Lower trim strip for rear door

Lower trim strip, removing and installing

1 - Lower trim strip

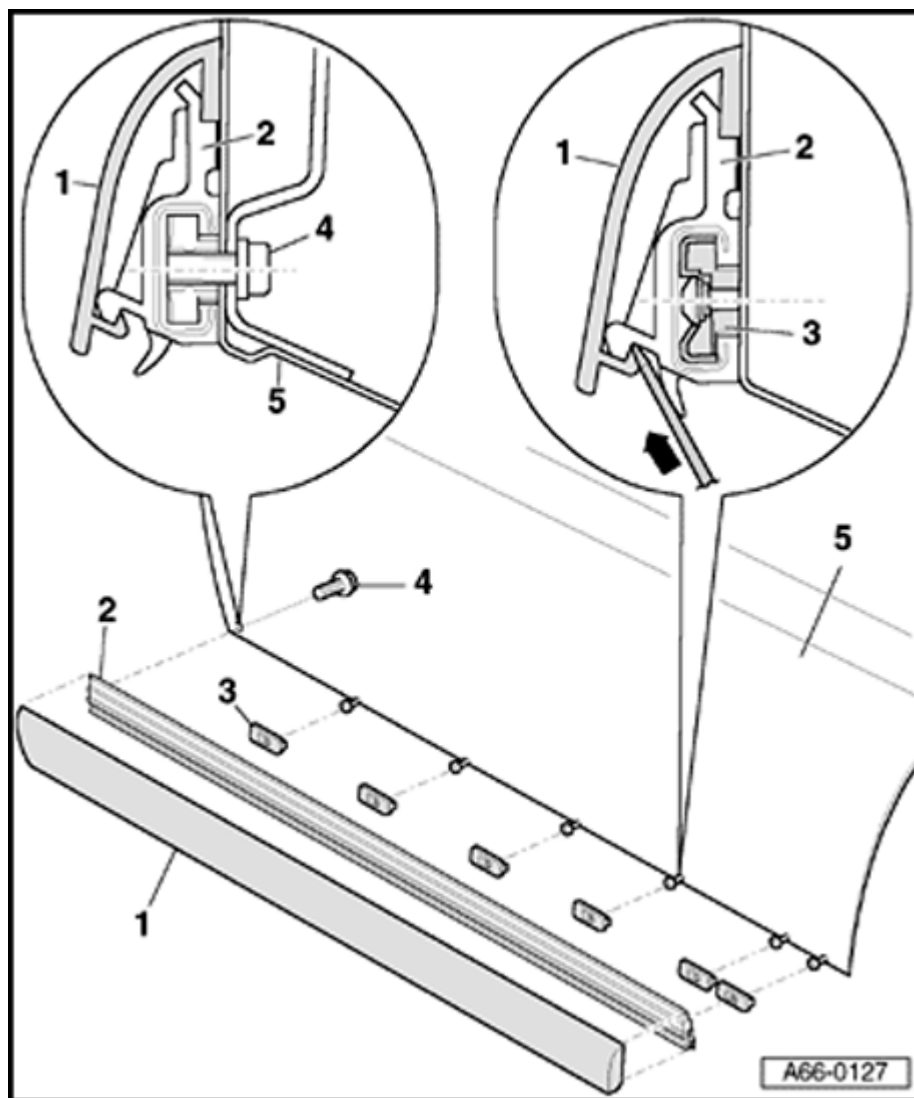
- ◆ Remove combination bolts -3- and slide trim strip out of retaining clips -2- toward rear.
- ◆ Remove trim strip from toward side of door.
- ◆ Installation is the reverse of removal.

2 - Retaining clip

3 - Combination bolt

- ◆ 1 Nm

4 - Rear doors



Lower trim strip, removing and installing (S4)

1 - Lower trim strip

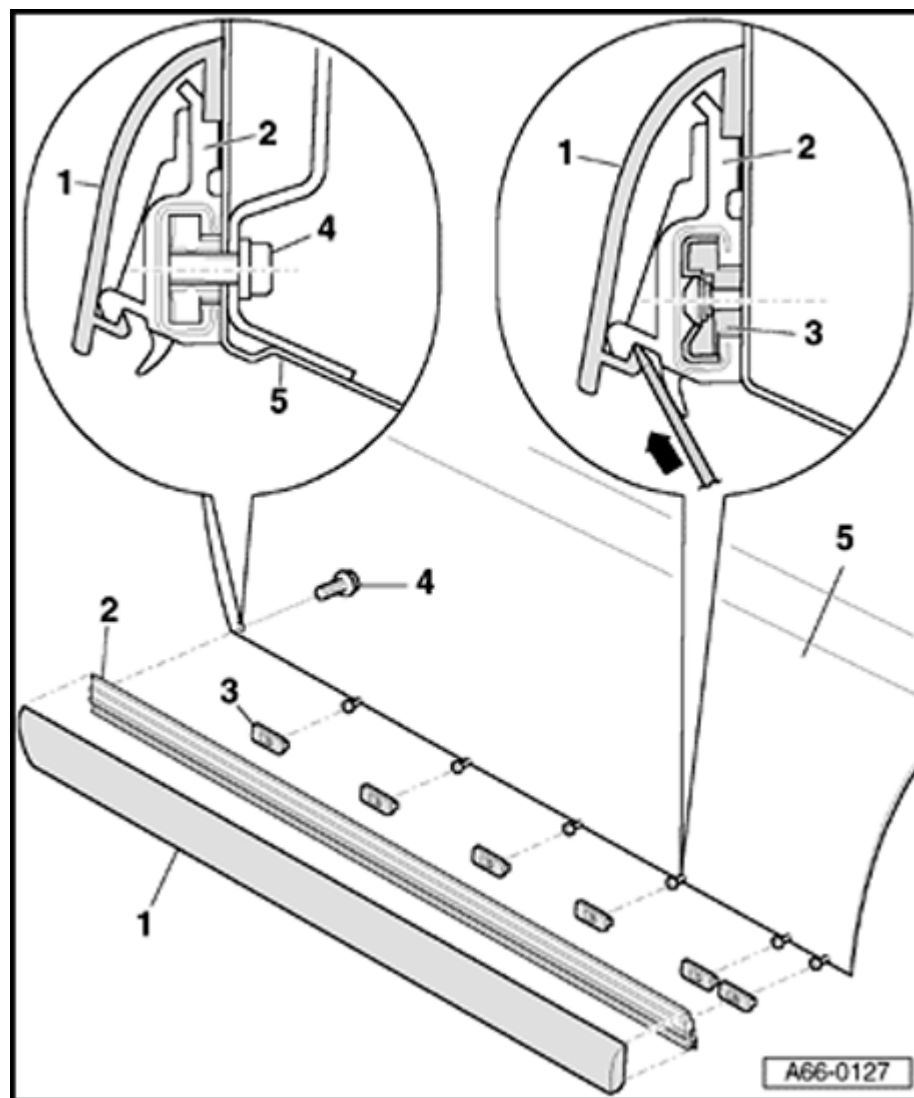
◆ Removing:

- To remove, gradually press tab on retaining strip upward and out of trim strip (arrow).
- Pull trim strip to side out of retaining strip during this process.

◆ Installing:

- Align trim strip and place onto retaining strip from top to bottom.
- Press lower trim strip onto retaining strip from side.

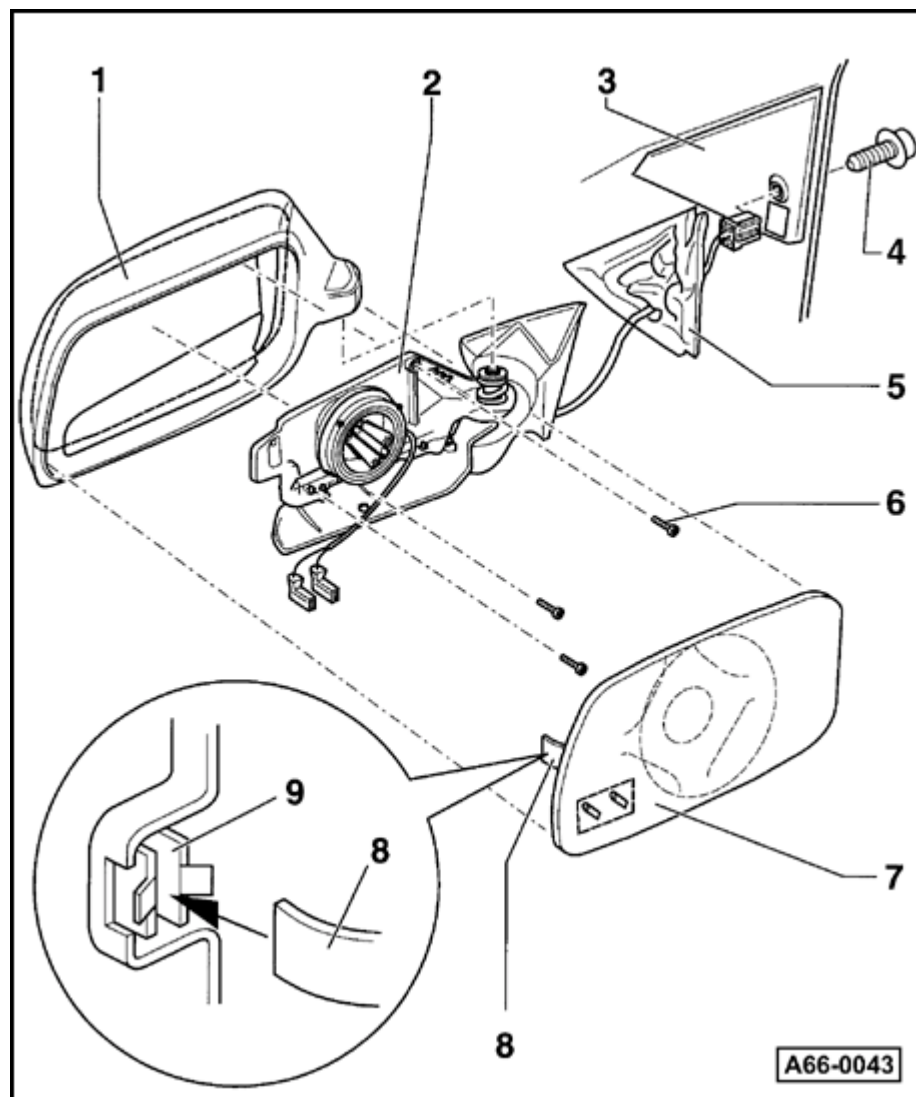
66-7

**2 - Retaining strip****3 - Retaining clip****4 - Combination bolt**

◆ 1 Nm

5 - Rear doors

66-14



Door mirrors

Door mirrors, removing and installing

1 - Mirror housing

- ◆ Can be removed from door without removing mirror completely ⇒ [page 66-16](#)

2 - Mirror adjuster

- ◆ Before removing, remove mirror from door
 - To remove, pry off mirror glass, disconnect harness connectors for mirror heating, remove phillips head screws -6- and take mirror adjustor -1- out of mirror housing.

Note:

On vehicles with seat memory, door trim must be removed before removing mirror adjustor.

3 - Door component carrier

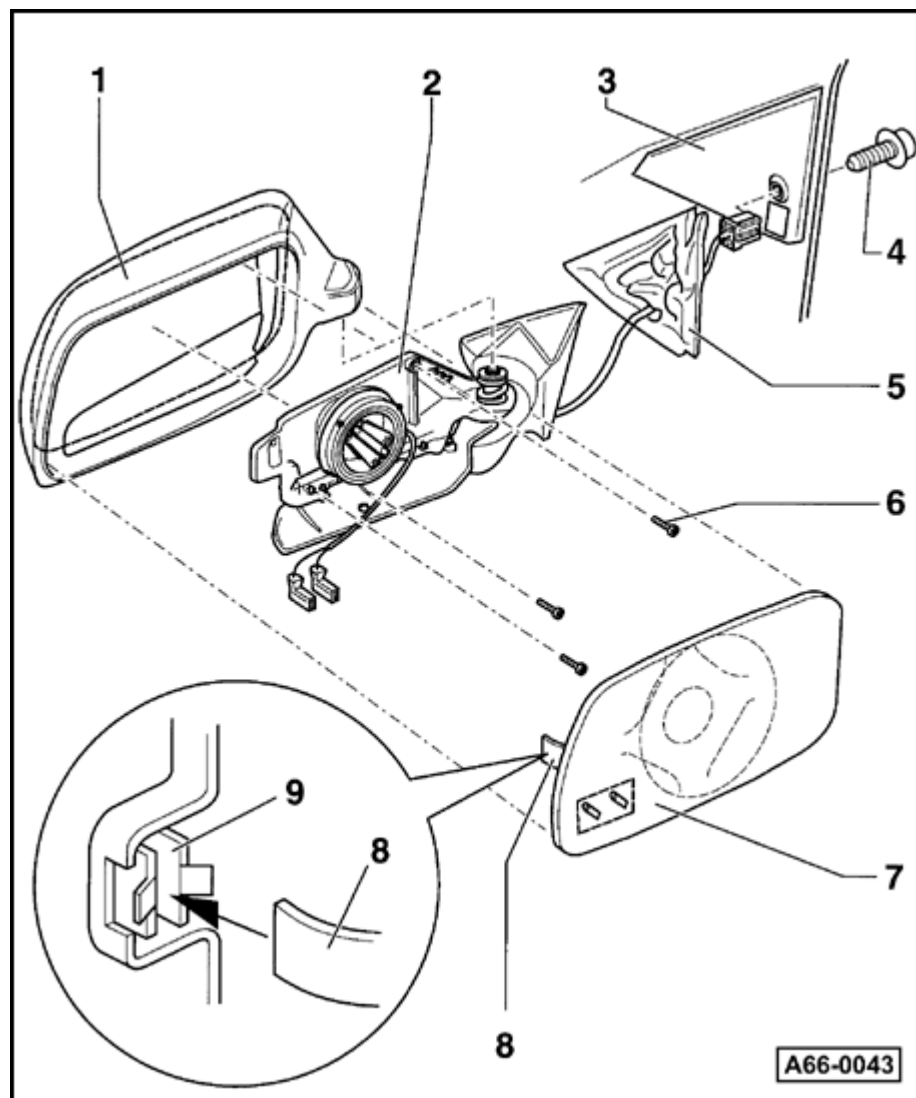
4 - Socket head screw

- ◆ 12 Nm (9 ft lb)

5 - Seal

- ◆ Check for correct fit during installation.

66-15

**6 - Phillips head screw**

- ◆ 1 Nm (9 in. lb)

7 - Mirror glass

- To remove, use special tool 80-200 (assembly lever).
- ◆ Use fabric reinforced adhesive tape at top and bottom to protect mirror housing from paint damage
- Pry mirror out at bottom first, then top.
- To install, first insert mirror lens into guide stud and friction finger in friction spring, then press on.
- ◆ Apply pressure only to center of lens; always wear protective gloves

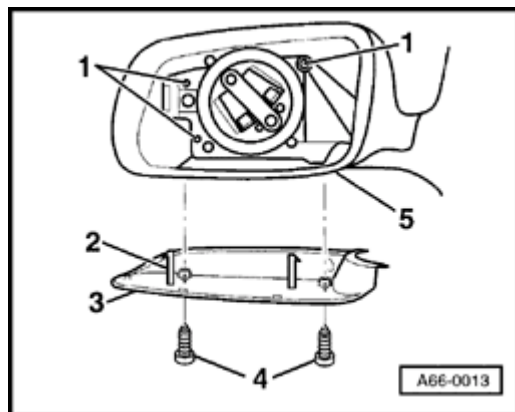
8 - Friction finger

- ◆ Friction finger -8- must be pushed into friction spring -9- when inserting mirror glass in housing

9 - Friction spring

Door mirror housing, replacing

- Remove mirror glass.
- Remove screws -4- (2x).
- Press back retainers -2- and take off cover -3- downward.
- Remove screws -1- at mirror adjusting unit (3x).
- Lift up housing -5- and remove.



Power mirror adjuster, replacing

- Disconnect battery.
- Remove mirror glass.
- Remove screws -1- (3x)
Tightening torque: 1 Nm (9 in. lb)
- For mirror adjusting units with harness connectors, these should be removed before disassembly.

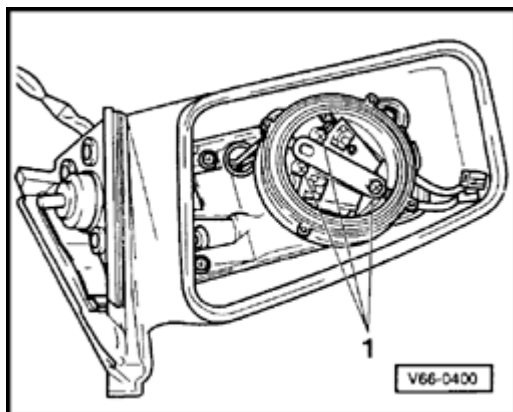
Note:

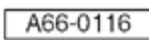
For mirror adjusting units with soldered wires, these should be separated individually directly at the housing.

- Install wiring into connector housing enclosed with replacement unit.

Note:

Transfer wire routing from old power mirror adjuster using correct wiring diagram.





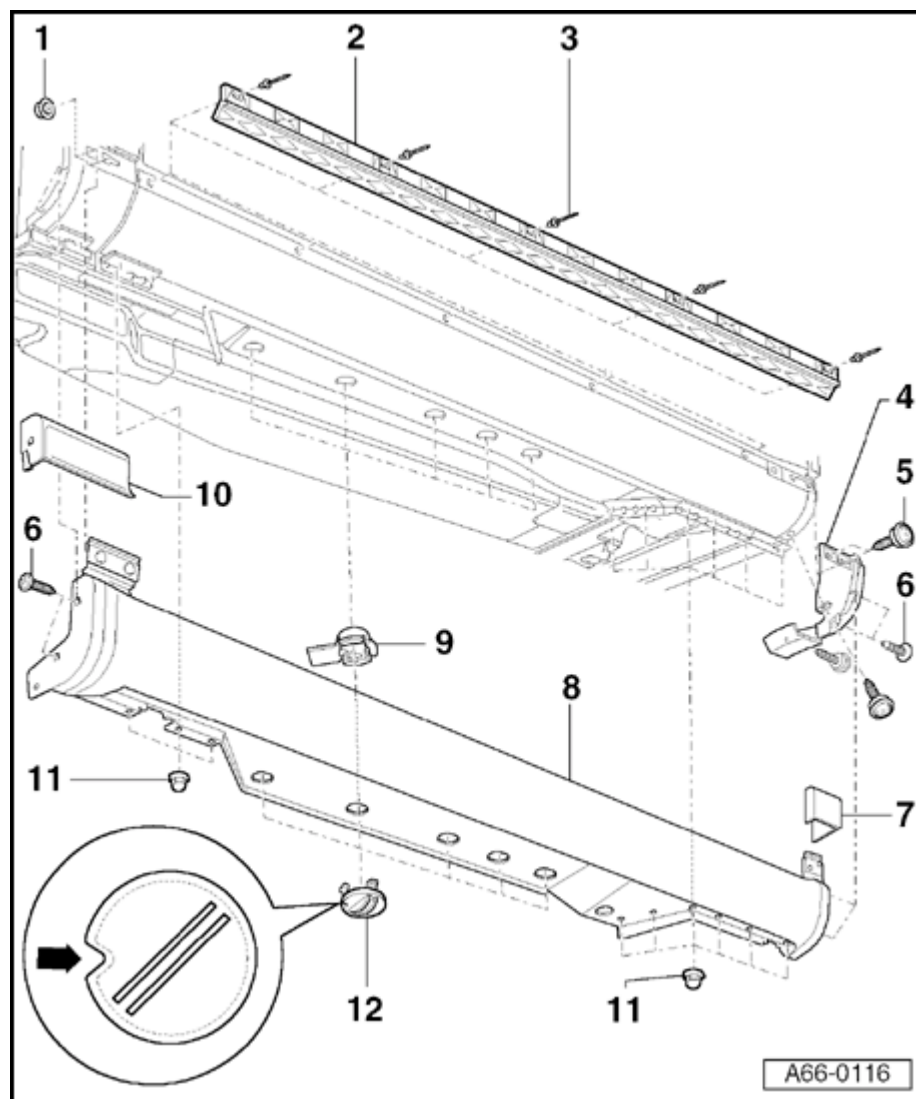
1 - Hex nut

◆ 1 Nm

- ◆ Adhesive surfaces must be free of dust and grease before pressing on retaining strip.
- ◆ Self-adhesive, remove protective foil just prior to assembly.

- Use hot air gun to warm retaining strip to approx. 40 ° C (max 50 ° C) before assembly.
- Center retaining strip using one hollow rivet at the front and one at the rear.
- Press complete surface of retaining strip securely into adhesive areas at sill.
- Rivet retaining strip to sill, starting at front and moving toward rear.

66-23

**3 - Hollow rivet**

◆ 5x.

4 - Bracket**5 - Collar screw**

◆ 1.5 Nm.

6 - Phillips-head screw

◆ 1.5 Nm.

7 - Rear trim piece◆ Removing ⇒ [Fig. 2](#) .**8 - Rocker panel cover for sill**◆ Before removing, remove rear trim piece - 7- ⇒ [Fig. 2](#) .

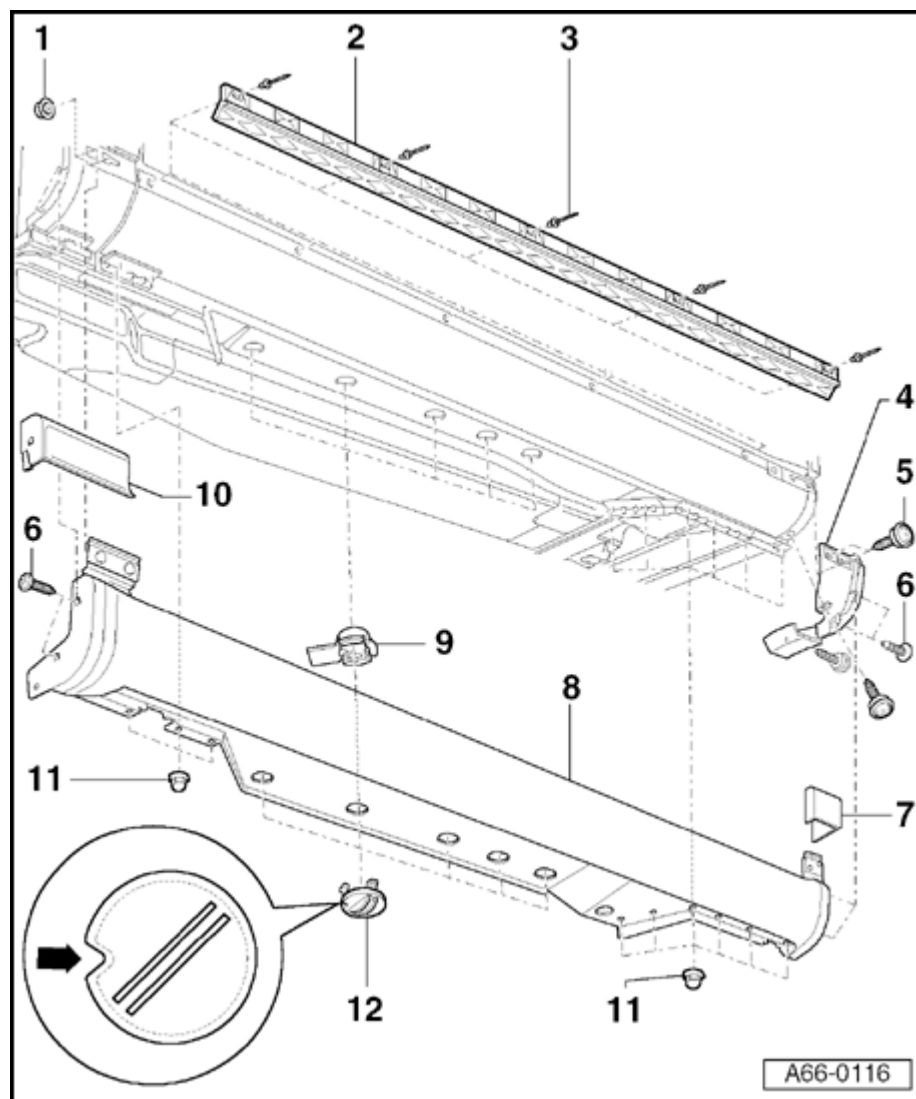
◆ Remove front end piece -10-.

- Remove Phillips-head screws -6- at front and rear.

- Disengage twist locks -12- and remove.

- Remove cap nuts -11-.

66-24

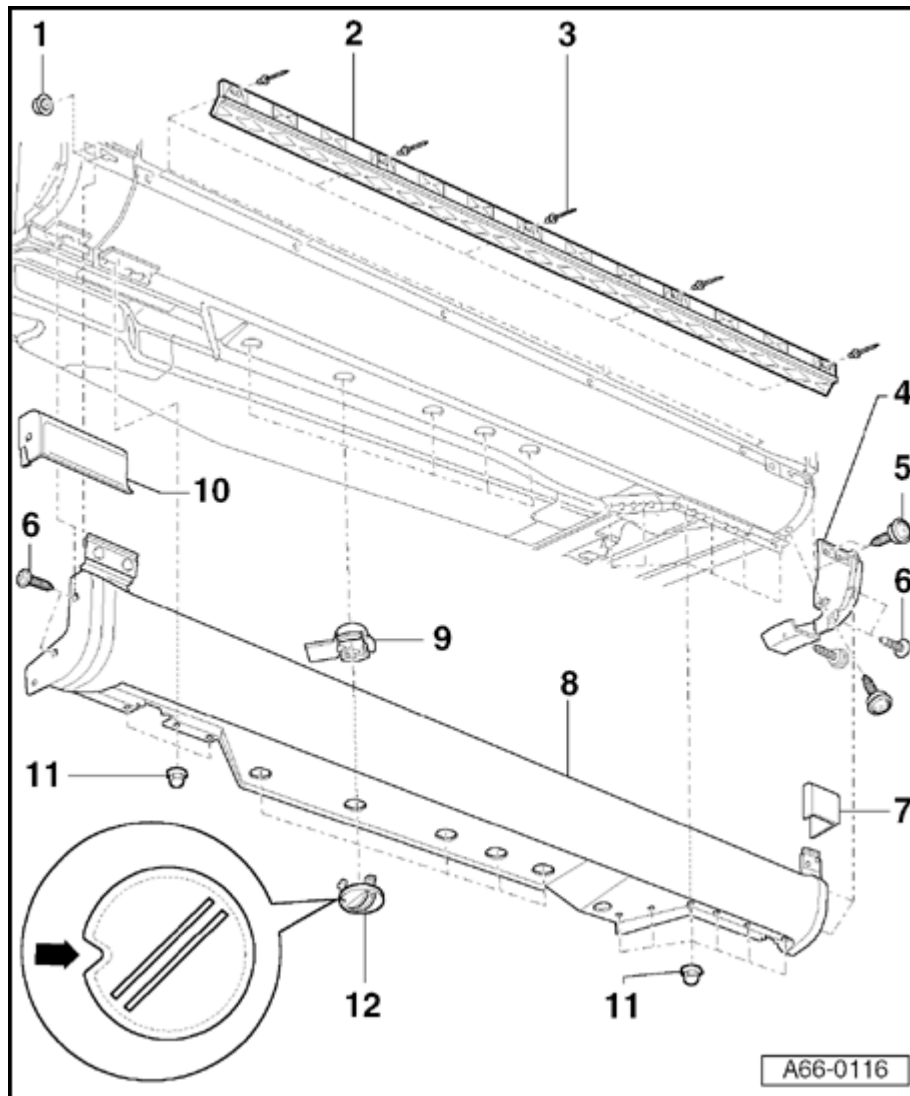


- Remove bolts for securing wheelhousing liner near hex nuts -1-.
- Press wheelhousing liner to side and remove hex nuts -1-.
- Bolts for securing the EVAP canister must also be removed on right-hand side.
- Pull rocker arm cover slightly forward out of bracket -4- and remove from sill.

9 - Mount for twist lock

- ◆ Tab on mount must face vehicle interior.

66-25

**10 - Front end piece**

◆ Removing ⇒ [Fig. 1](#) .

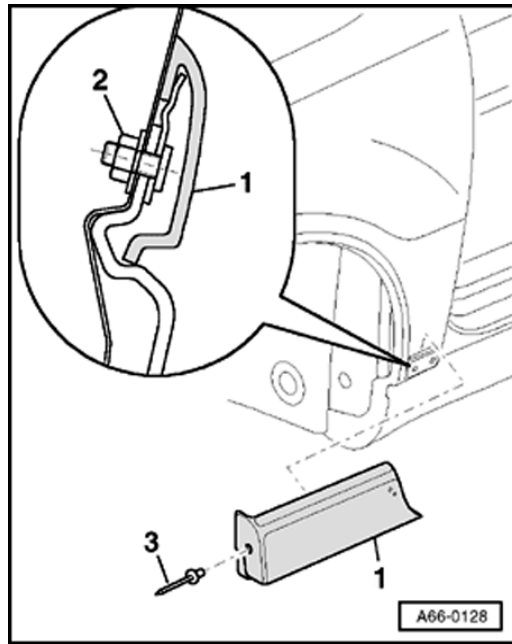
11 - Cap nut

◆ 1.5 Nm.

12 - Twist lock

◆ Notch (arrow) must face front of vehicle.

66-26

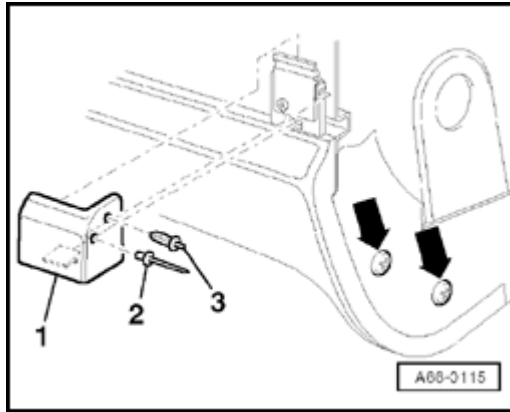


A

Fig. 1 Removing and installing front end piece

- Remove front wheel.
- Drill rivet heads off hollow rivets -3- and knock rivet shaft through.
- Remove wheelhousing liner bolts around front end piece.
- Press wheelhousing liner to side and remove hex nut -2-.
- Remove front end piece -1- from fender toward side.

66-27

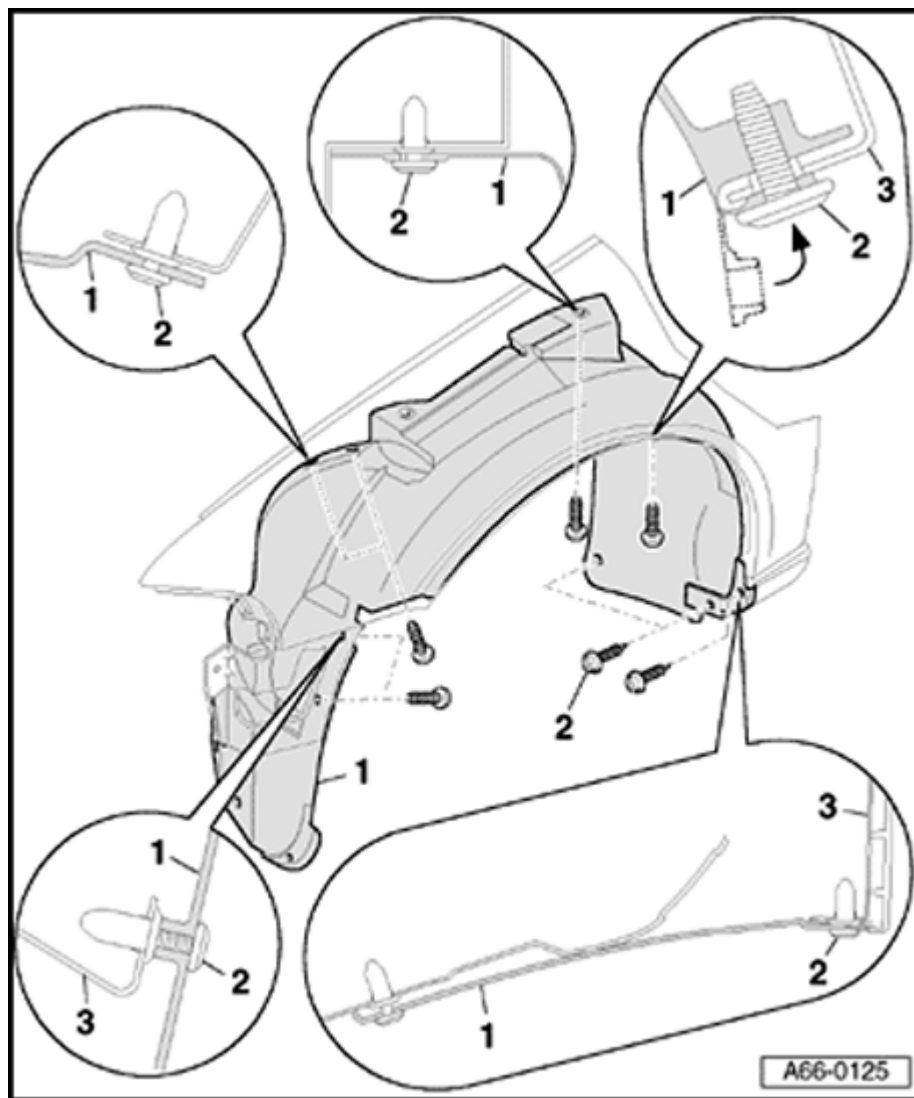


A

Fig. 2 Removing and installing rear trim piece

- Drill rivet head off hollow rivet -2- an knock rivet shaft through.
- Push pin through expanding clip and remove expanding clip from trim piece.
- Pin is required when reinstalling expanding clip.
- Pull trim piece up and out of bracket first and then remove.
- For further removal of rocker panel cover, remove Phillips-head screws (arrows).

66-31



Front wheelhousing liner, removing and installing

1 - Front wheelhousing liner

◆ Front wheel removed.

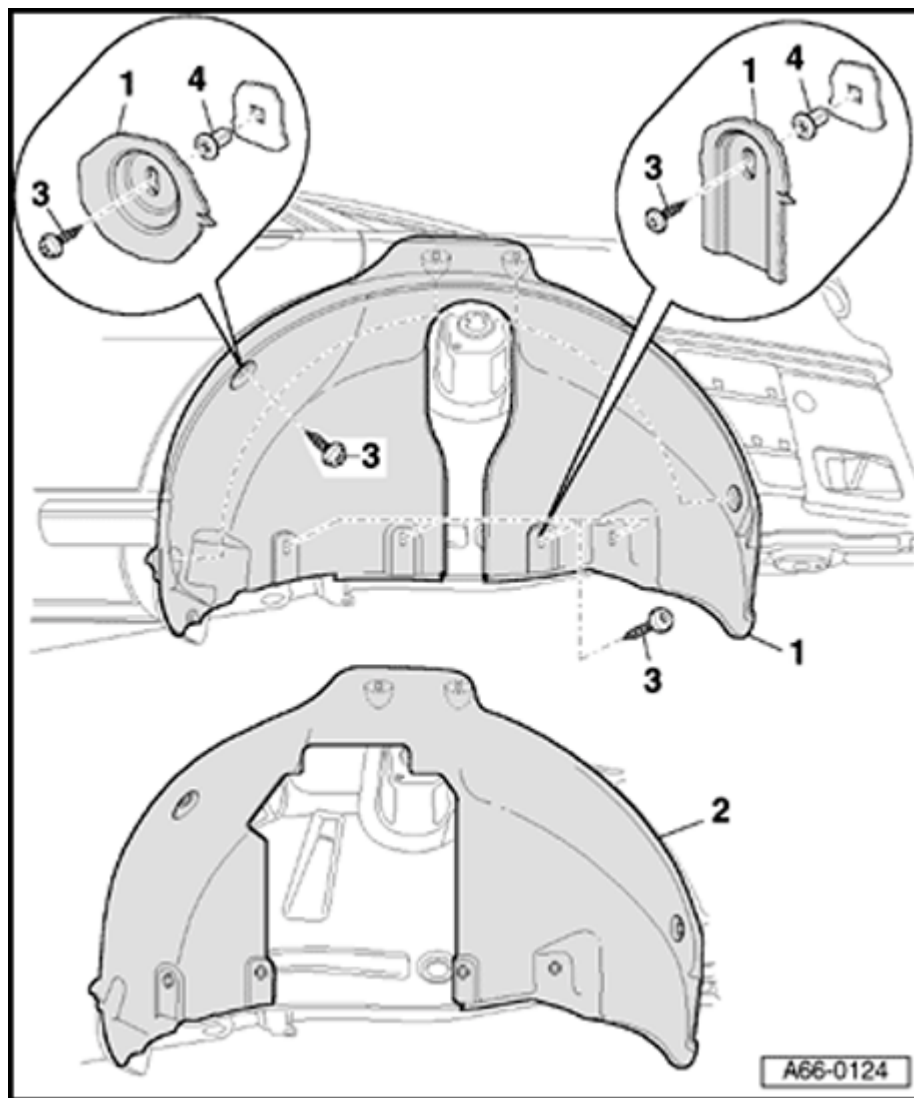
- To remove, remove bolts -2- (10x) and remove wheelhousing liner below fender.
- When installing, press plastic tabs (dotted line in illustration) in direction of arrow into the holes on fender and then install Phillips-head screws.

2 - Phillips-head screws

◆ 2.5 Nm

3 - Fender

66-32



Rear wheelhousing liner, removing and installing

1 - Rear wheelhousing liner (Front Wheel Drive vehicles)

◆ Rear wheel removed.

- Remove Phillips-head screws -3- at top (5x) and bottom (4x).
- Remove wheelhousing liner from side panel above suspension strut mount.

2 - Rear wheelhousing liner (Quattro)

◆ Removing and installing same as for Front Wheel Drive.

3 - Phillips-head screw

◆ 2.5 Nm

4 - Clip

Seat belts

Safety precautions for handling pyrotechnic seat belt tensioners

WARNING!

- ♦ *Testing, removing, installing and repair work must only be carried out by properly qualified personnel.*
- ♦ *When connecting the seat belt tensioner unit, all mechanical components (including those of the three-point seat belt) must be properly attached.*
- ♦ *Only the technician carrying out the work may be present inside the vehicle.*
- ♦ *The seat belt tensioner components cannot be opened or repaired; always use new components.*
- ♦ *Seat belt tensioner units which have been dropped from a height of more than 20 inches must not be installed in a vehicle.*
- ♦ *Seat belt tensioner units which are mechanically damaged (dents, cracks) must always be replaced.*

- ♦ *The seat belt tensioner unit should not be removed from its packaging until just before it is to be installed.*
- ♦ *If the installation work is interrupted, return the seat belt tensioner unit to its packaging.*
- ♦ *Never point the open end of a seat belt tensioner at another person.*

WARNING!

- ♦ *Always wash your hands after handling seat belt tensioners which have been triggered.*
- ♦ *Observe all transportation regulations for explosive substances.*
- ♦ *Do not leave an uninstalled seat belt tensioner unit unattended.*
- ♦ *Seat belt tensioner units must not be treated with grease, cleaners or similar substances.*
- ♦ *Seat belt tensioner units must not be exposed to temperatures above 100 ° C (212 ° F), even for short periods.*

Pyrotechnic seat belt tensioners, disposal

WARNING!

- ♦ *Improper disposal of pyrotechnic seat belt tensioner units (gas generators) which have not been triggered creates a hazard.*
- ♦ *Pyrotechnic seat belt tensioner units (gas generators) must be rendered inoperable before disposing because pyrotechnic devices can cause injury if disposed of improperly (e.g. using a blow torch).*
- ♦ *Seat belts which need to be removed (e.g. after an accident in which the seat belt tensioner was not activated) must be triggered before removal.*
- ♦ *This does not apply to seat belts with malfunctions (e.g. sticking or failure to retract) which must be returned to the Warranty Parts Test Center for analysis.*
- ♦ *Observe all transportation regulations for explosive substances.*
- ♦ *Procedure for rear belt tensioners is*

analogous to front (shelf, remove trim on side of trim or remove 2/3 of backrest cover).

Procedure for triggering pyrotechnic belt tensioners

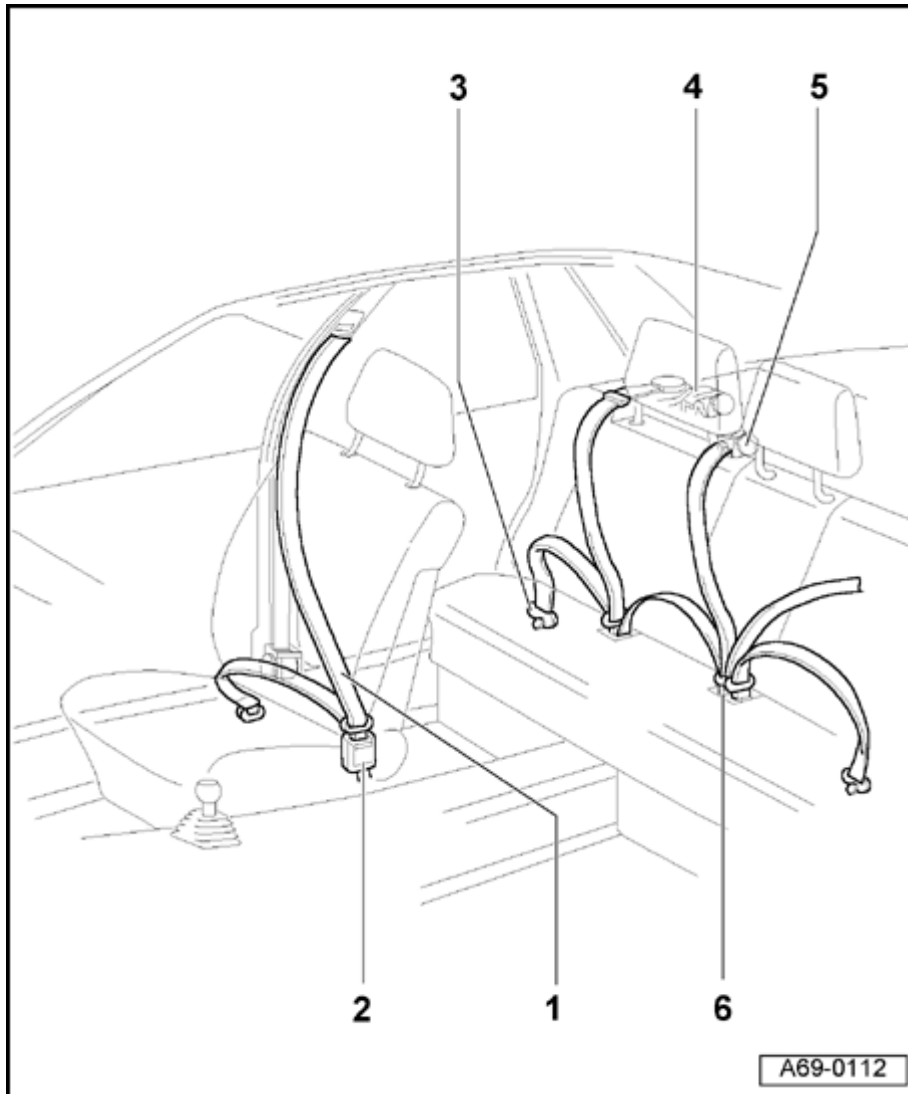
Notes:

- ◆ *Whenever possible, pyrotechnic belt tensioners must be deployed outside the vehicle. Use Airbag and Pyrotechnic Deployment Device J-44210 and follow instructions in booklet.*
- ◆ *The procedure that follows is for deployment of tensioners mounted inside a vehicle.*
- Remove upper B-pillar trim ⇒ [page 70-75](#) .
- Remove lower B-pillar trim ⇒ [page 70-75](#) .
- Remove outer seat belt anchor ⇒ [page 69-13](#) .
- Using scissors, cut belt webbing above seat belt tongue (about 20 cm above belt retractor).
- Disconnect harness connector from belt retractor and connect wiring harness (Part No. 8D1 971 259) to belt tensioner.
- Cut harness connector at opposite end, insulate

both ends of cable, pull cable housing apart until ends of cable are at least 30 cm apart.

- Vehicle must not be occupied
- Open windows and close doors.
- Using wiring harness and an external battery (located outside vehicle), activate gas generator (maintain minimum 10 m distance).

- Air out vehicle after triggering.
- ◆ After removal, the belts can be disposed of as commercial waste.
- ◆ Wash your hands after handling belt tensioners that have fired.
- ◆ Follow safety and handling instructions for pyrotechnic belt tensioners.



Seat belt attachment points, overview

1 - Three-point seat belt with seat belt height adjuster and belt tensioner

◆ Removing ⇒ [page 69-7](#)

2 - Buckle attachment point

◆ Removing ⇒ [page 69-12](#)

3 - Attachment point for outer floor assembly

◆ Removing ⇒ [page 69-13](#)

4 - Left and right-rear three-point seat belt

Sedan:

◆ Removing ⇒ [page 69-15](#)

Avant:

◆ Removing ⇒ [page 69-18](#)

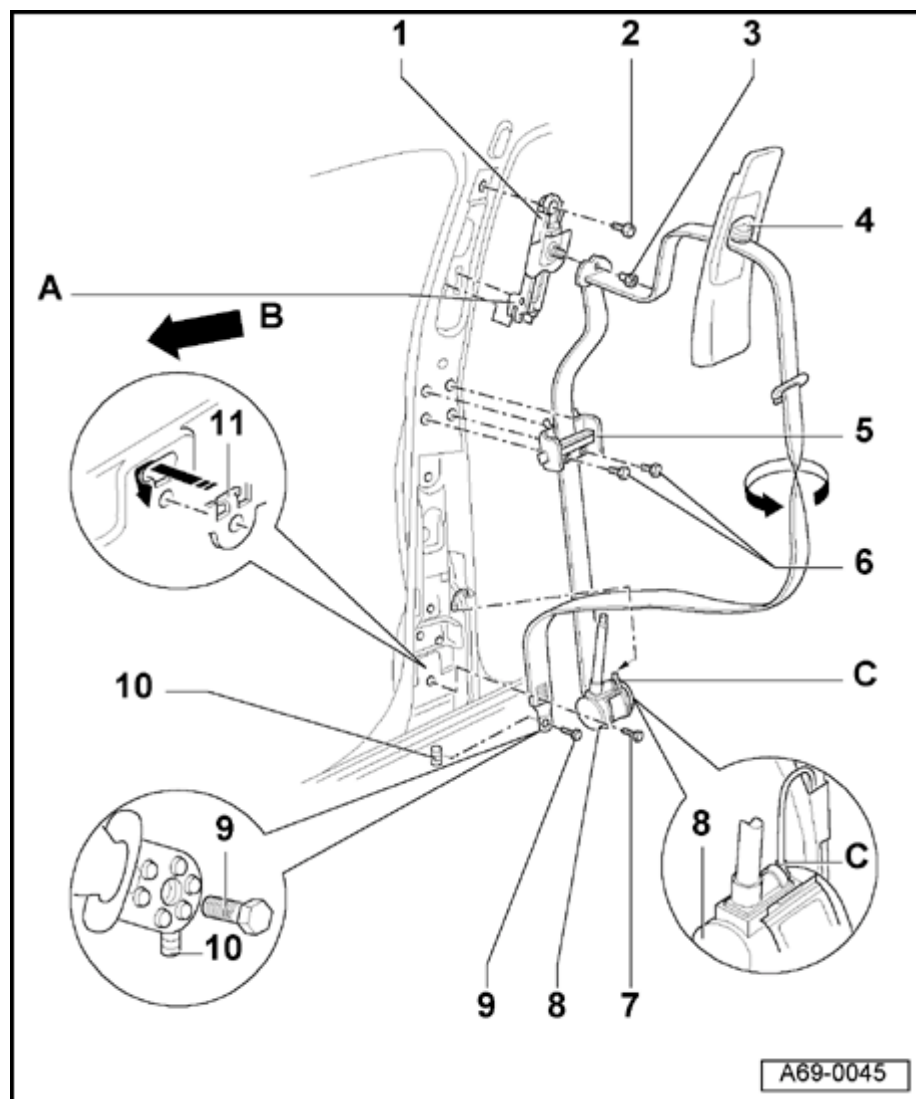
5 - Rear center three-point seat belt

◆ Floor rear backrest

◆ Removing ⇒ page ⇒ [Page 69-22](#)

6 - Attachment point for center floor assembly

◆ Removing ⇒ [page 69-25](#)



Three-point seat belt with seat belt height adjuster and belt tensioner, removing and installing

1 - Seat belt height adjuster

Removing:

- Remove upper B-pillar trim ⇒ [page 70-75](#).
- Remove shouldered nut -3- and bolt -2-.
- Remove seat belt height adjuster -1- up and out of position -A-.

Installing:

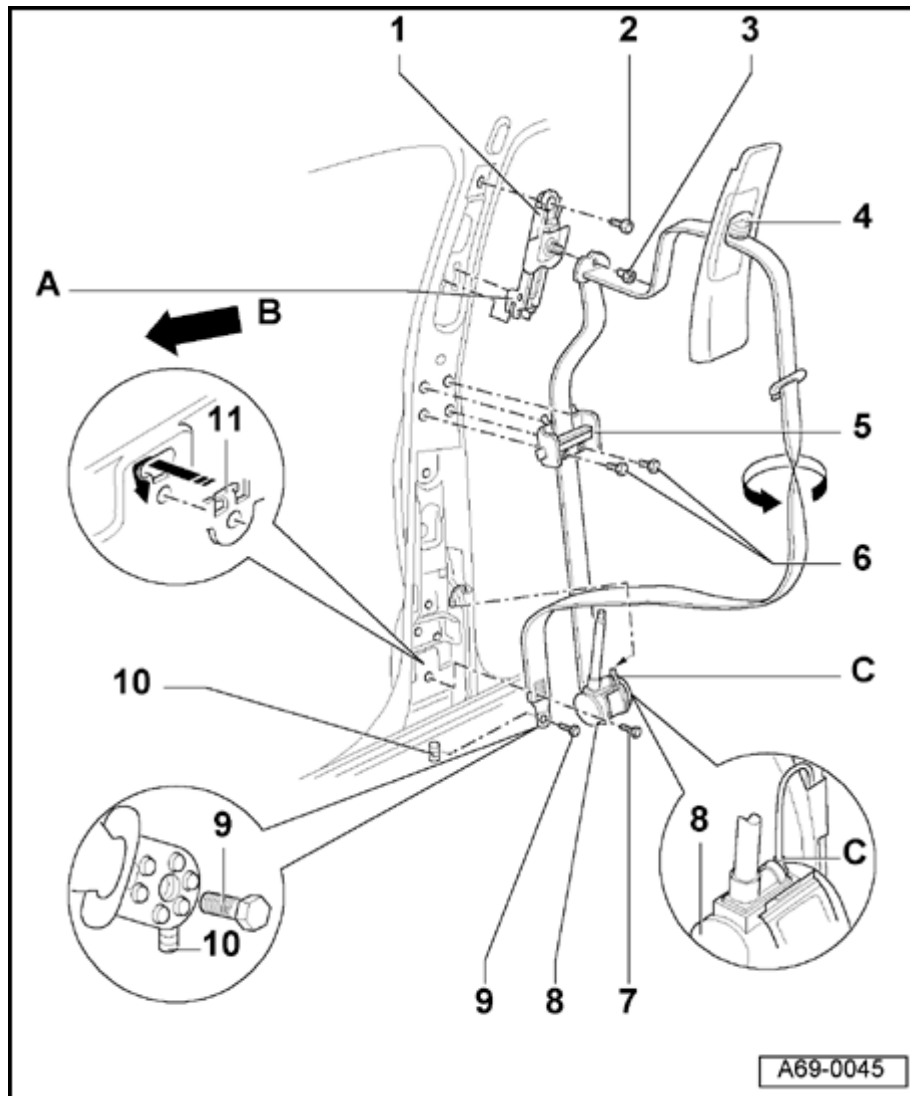
- Guide seat belt height adjuster switch -4- into height adjuster assembly -1-.

Notes:

- ◆ Do not press switch -4- when installing.

Function check after installing trim:

- ◆ Height adjuster must audibly engage into all five of the possible positions (even in the top position).
- ◆ Switch must return by itself to upper position after being actuated.

**2 - Bolt**

◆ 23 Nm (17 ft lb)

3 - Shouldered nut

◆ 50 Nm (37 ft lb)

4 - Switch for height adjustment**5 - Belt guide**

- Remove bolts -7- (2x).

◆ Unclip lower part of belt guide, swing upward and detach

6 - Bolts (2x)

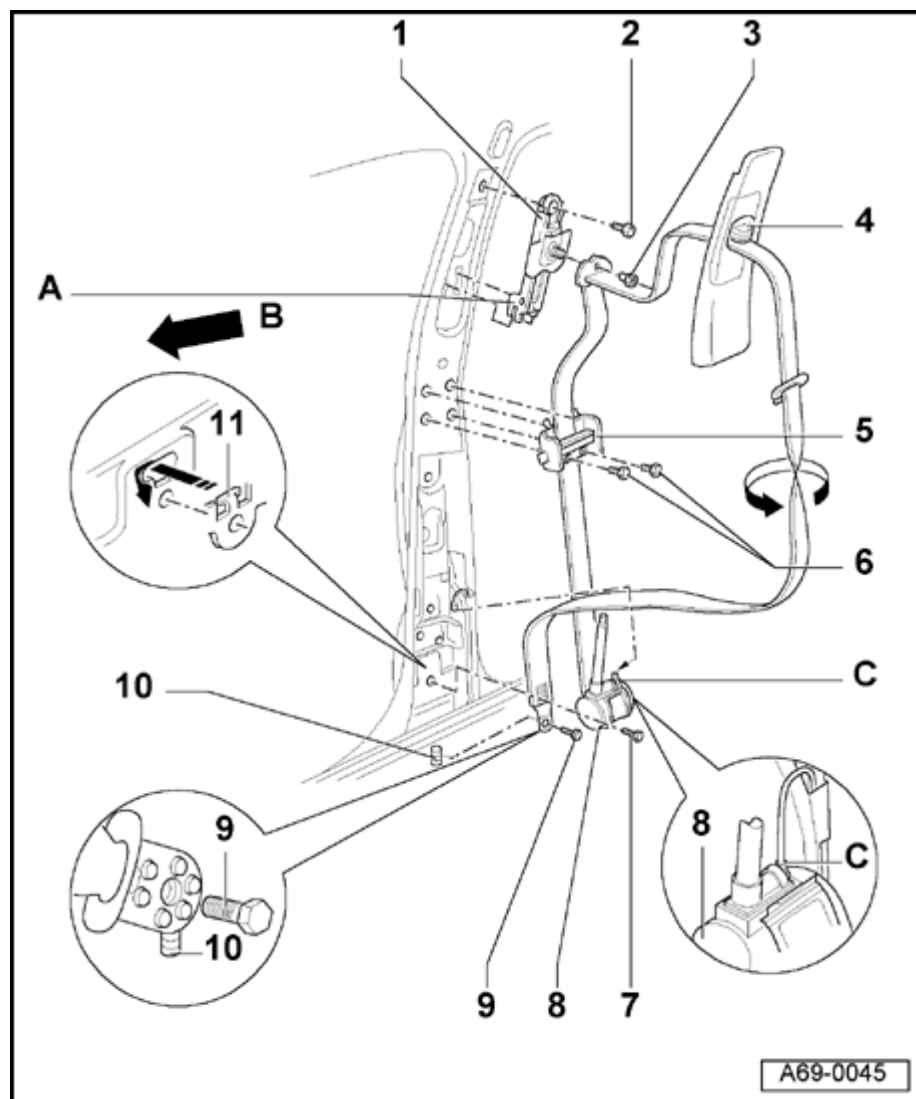
◆ 2 Nm (18 in. lb)

7 - Bolt

◆ 50 Nm (37 ft lb)

8 - Bolt

◆ 50 Nm (37 ft lb)



9 - Belt tensioner

Removing three-point seat belt:

- Disconnect battery.
- Removing sill molding ⇒ [page 70-80](#) .
- Remove bolt -9- (1x).
- Remove upper B-pillar trim ⇒ [page 70-75](#) .
- Remove belt webbing from upper B-pillar trim.
- Remove lower B-pillar trim ⇒ [page 70-75](#) .
- Remove shouldered nuts -3-.
- Disconnect harness connector -C- at belt tensioner.
- Remove bolt -7-.
- Remove belt tensioner -9- upward out of anti-twist stop -11-.

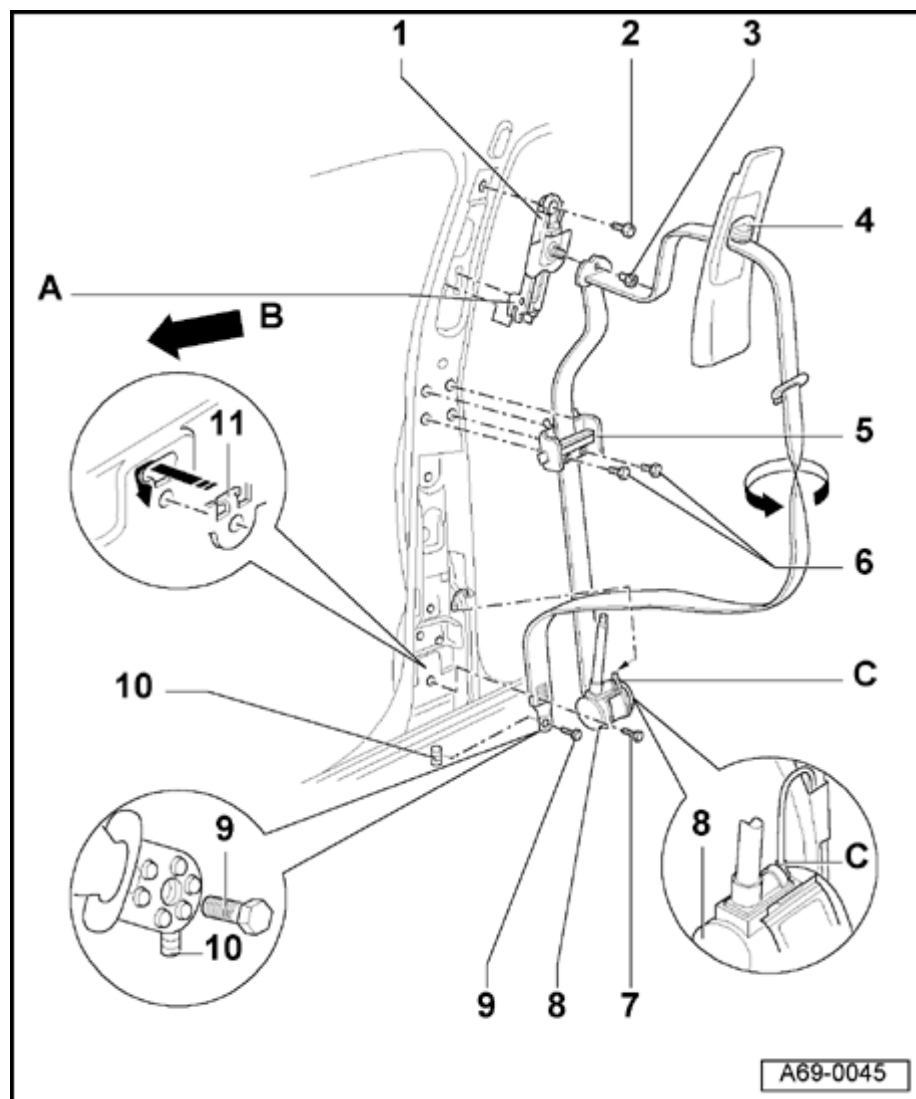
Installing three-point seat belt:

Note:

Arrow -B- indicates direction of travel.

- Install belt tensioner -9- with anti-twist stop -11- as shown in magnified area.

- Install belt webbing (turned 180°) as shown in illustration (arrow).



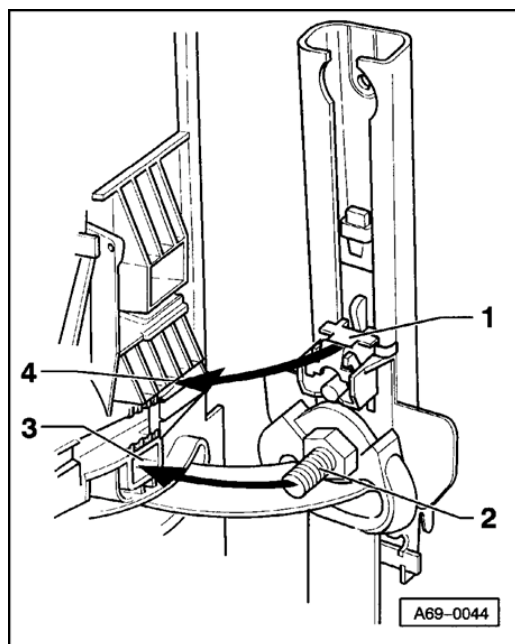
- ◆ Lower belt webbing must be bolted to metal stud -10- as shown in magnified area
- ◆ Remainder of installation is reverse of removal
 - After installing passenger side three-point seat belt, check belt function for child seat ⇒ [page 69-37](#) .
- ◆ Three-point seat belt must not be hindered by cables, wires or dampening material etc

10 - Metal stud in floor pan

- ◆ Anti-twist stop for belt webbing bracket

11 - Anti-twist stop and reverse-mounting protection for three-point safety belt

69-11



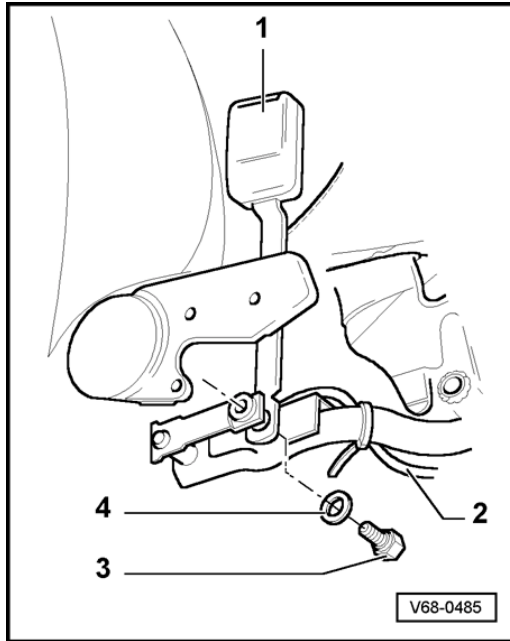
A

Fig. 1 Installing upper B-pillar trim in belt height adjuster

- Guide slide with button -4- (without pressing) beginning at top and working downward into release lever -1- of height adjuster while simultaneously installing pin -2- into mounting -3-.

69-12

Belt buckle attachment point



4

- Remove seat ⇒ [page 72-2](#) .

1 - Buckle

4 - Spring washer

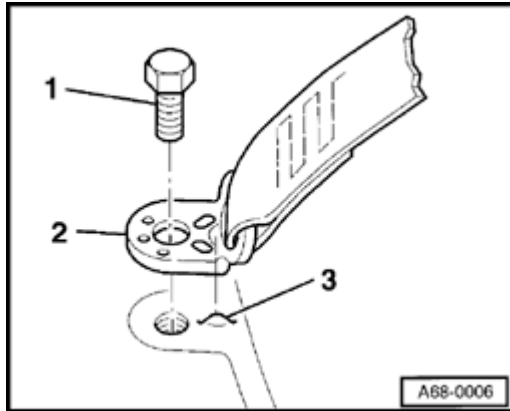
- Remove bolt -3-.

Tightening torque: 60 Nm (44 ft lb)

- If necessary, disconnect harness connector -2- for belt warning.

69-13

Outer floor assembly attachment point



4

- Remove bolt -1-.

Tightening torque: 50 Nm (37 ft lb)

Mounting bracket -2- must be located in impression -3- of floor assembly.

69-14

Recaro seat buckle, removing and installing

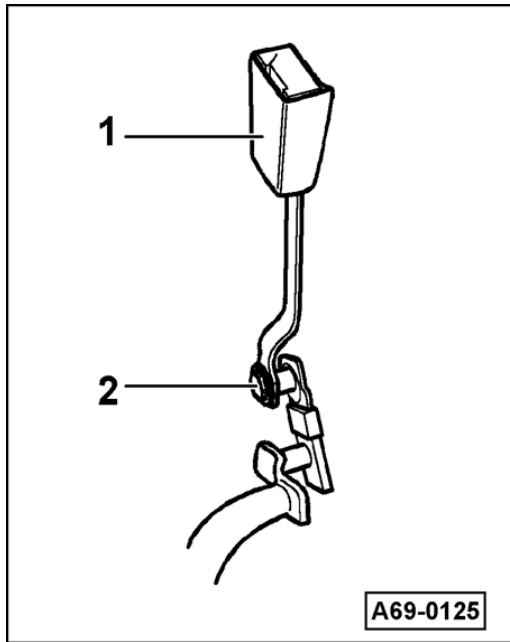
- Remove seat ⇒ [page 72-25](#) .

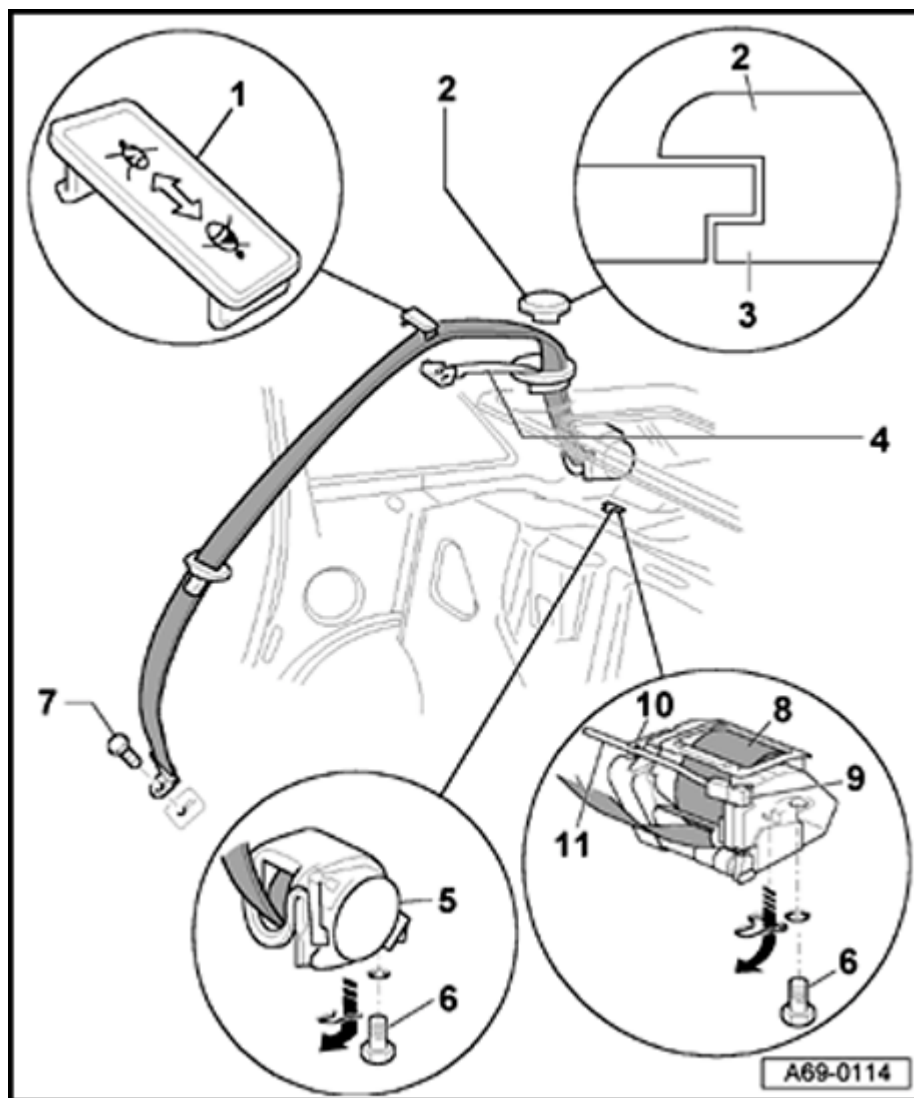


- Turn buckle -1- downward to allow access to bolt -2-.

- Remove bolt -2-.

Tightening torque: 60 Nm (44 ft lb)





Left and right-rear three-point seat belts, removing and installing

Sedan

1 - Belt guide trim

- ◆ Large symbol must always point toward vehicle center

2 - Belt adjuster cover

3 - Retaining tab

4 - Belt adjuster

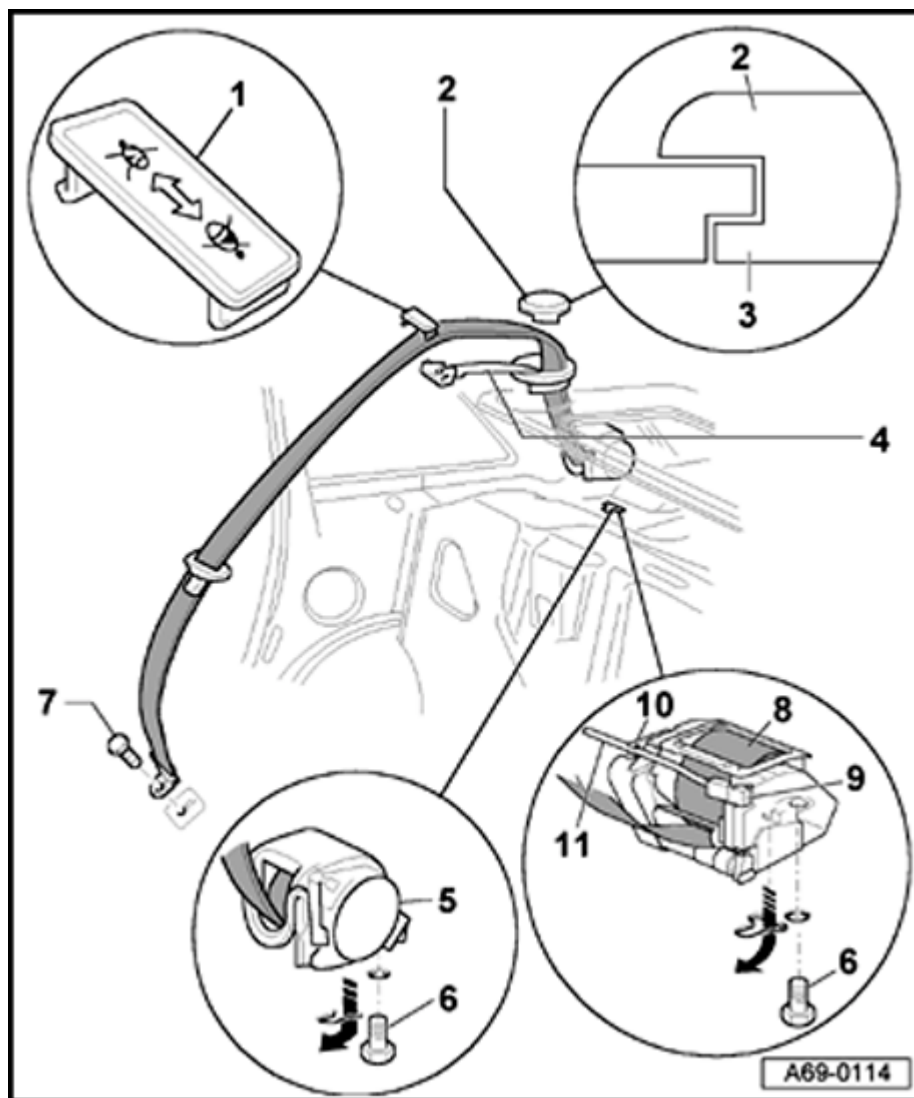
- ◆ Removing and installing ⇒ [page 69-20](#)

5 - Three-point seat belt

Removing:

- Remove rear seat ⇒ [page 72-57](#) .
- Remove bolt -7-.
- Unclip belt guide trim -1-.
- Detach belt adjuster cover -2- at left and right of retaining tab -3-.
- Remove rear shelf ⇒ [page 70-83](#) .
- Open cover for side trunk trim.

69-16



Vehicles with CD player and/or subwoofer or similar:

- Remove side trunk trim ⇒ [page 70-87](#) .

Vehicles with belt tensioners:

- Unclip igniter wire -11- at clip -10-.
- Detach harness connector for igniter wire at clip -9-.
- Remove bolt -6- (1x).
- Detach seat belt against direction of arrow.

Installing:

- ◆ Make sure harness connector for igniter wire -11- engages
- Clip igniter wire -11- into clip -10-.

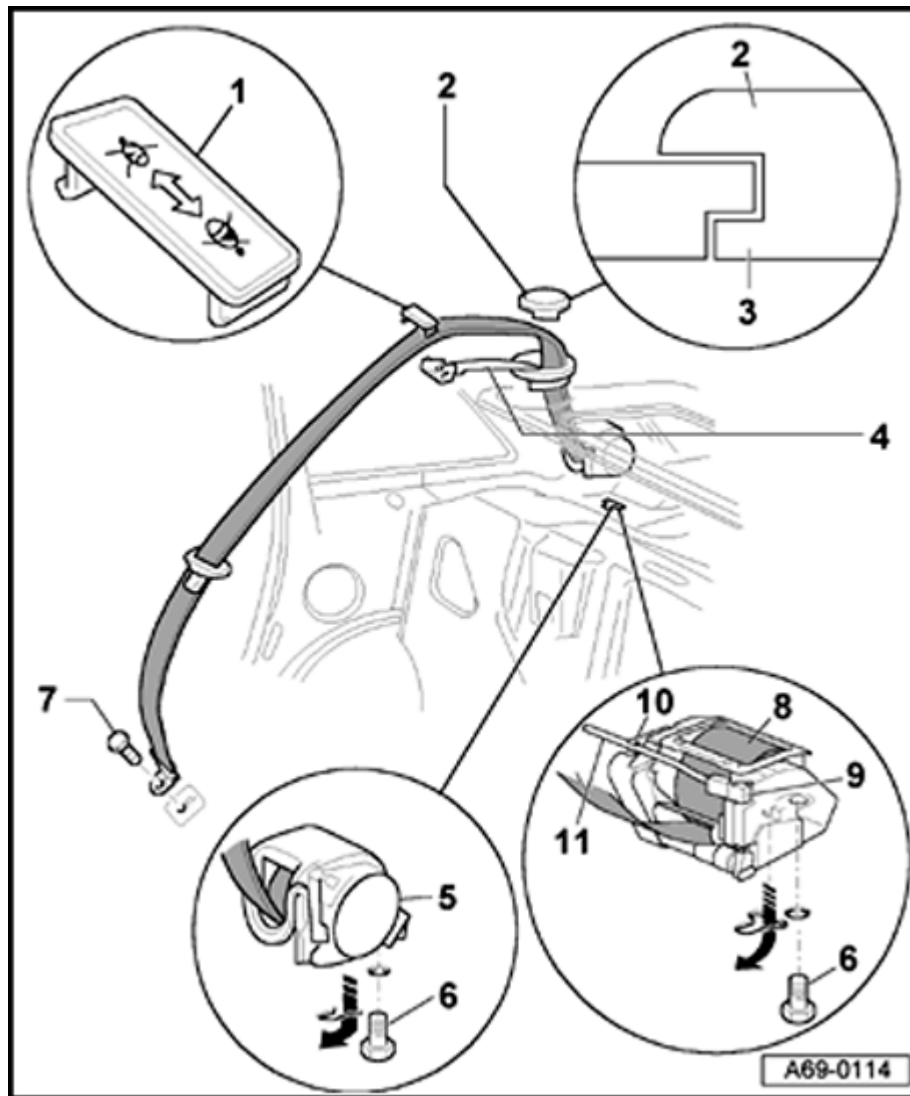
Note:

The igniter wire -11- must not be located near the belt webbing.

- ◆ For vehicles with belt tensioner, check belt-fastened sensor ⇒ [page 69-38](#)
- ◆ After installing rear three-point seat belt, check belt function for child seat ⇒ [page 69-37](#)

- ◆ Three-point seat belt must not be hindered by cables, wires or dampening material, etc

69-17

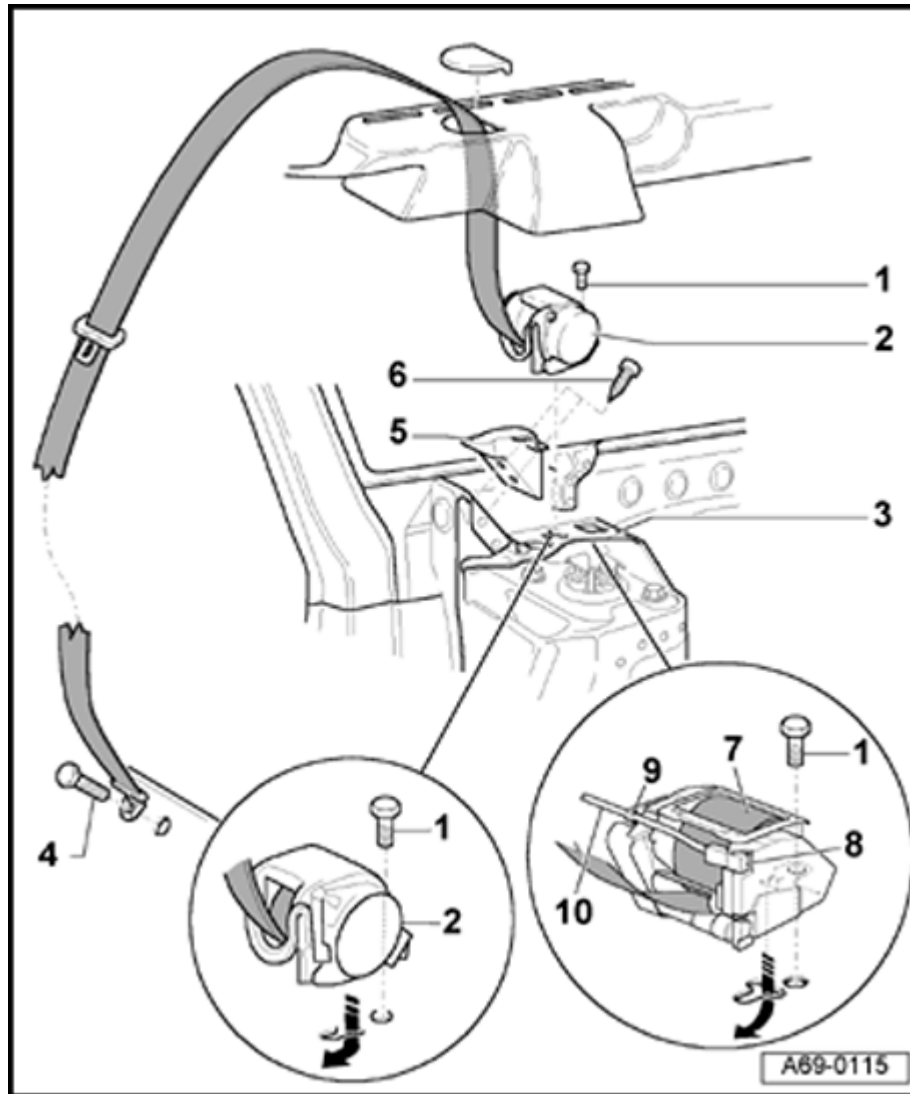
**6 - Bolt**

◆ 50 Nm (37 ft lb)

7 - Bolt

◆ 50 Nm (37 ft lb)

8 - Three-point seat belt with belt tensioner**9 - Clip****10 - Clip****11 - Igniter wire**



Avant

1 - Bolt

◆ 50 Nm (37 ft lb)

2 - Belt tensioner

Removing:

- Remove left and right-rear side bolsters
⇒ [page 72-75](#) .
- Remove left and right-side trunk trim ⇒
[page 70-87](#) .
- Remove rear seat ⇒ [page 72-57](#) .
- Remove bolt -4- (1x).

Vehicles with belt tensioners:

- Unclip igniter wire -11- at clip -10-.
- Detach harness connector for igniter wire
at clip -8-.
- Remove bolt -1- (1x).
- Detach seat belt against direction of
arrow.

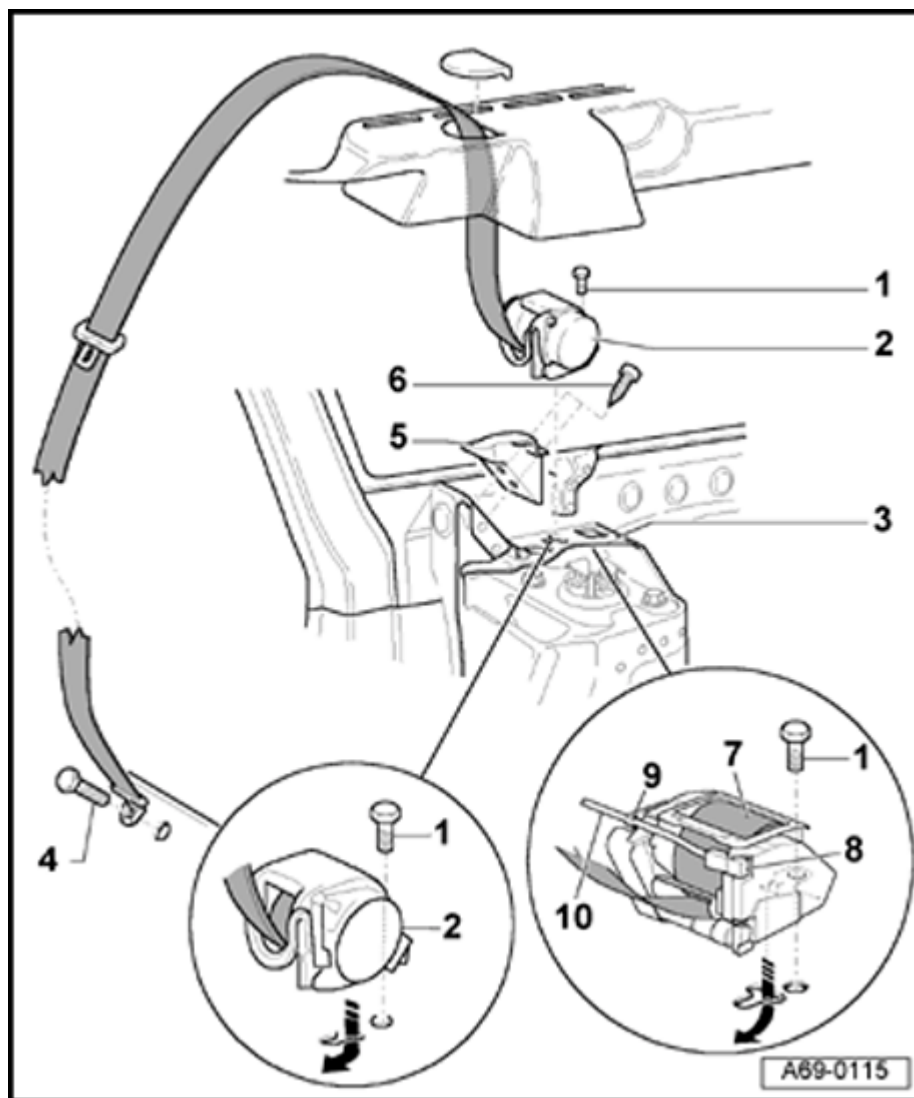
Installing:

- Make sure harness connector for igniter
wire -11- engages.
- Clip igniter wire -11- into clip -10-.

Note:

The igniter wire -11- must not be located near the belt webbing.

69-19



- ◆ For vehicles with belt tensioner, check belt-fastened sensor ⇒ [page 69-38](#)
- ◆ After installing rear three-point seat belt, check belt function for child seat ⇒ [page 69-37](#)
- ◆ The three-point seat belt must not be hindered by cables, wires or dampening material, etc

3 - Bracket

4 - Bolt

- ◆ 50 Nm (37 ft lb)

5 - Bracket

6 - Bolt

- ◆ 2.5 Nm (22 in. lb)
- ◆ It is not necessary to remove metal bracket when removing belt

7 - Three-point seat belt with belt tensioner

8 - Clip

9 - Clip

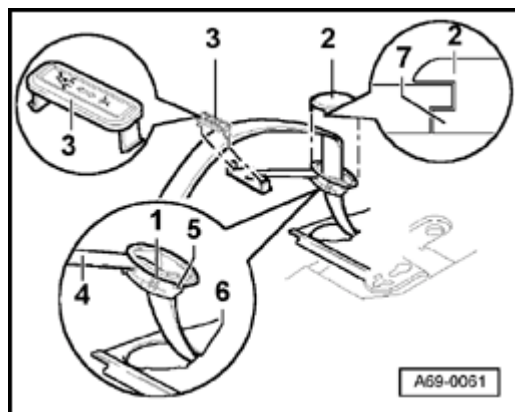
10 - Igniter wire

Rear belt adjuster, removing and installing

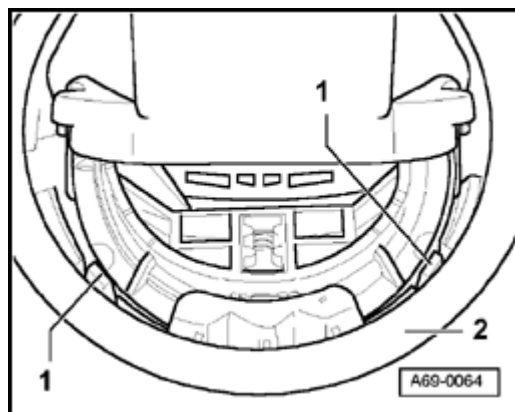
Removing

Note:

It is not necessary to remove the rear shelf when removing the rear belt adjuster.



- ⚠ - Undo lower attachment point of rear three-point seat belt.
Tightening torque: 50 Nm (37 ft lb)
- Unclip belt guide trim -3-.
- Detach belt adjuster cover -2- at left and right of retaining tab -7-.
- Swing belt adjuster -4- with belt webbing upward.

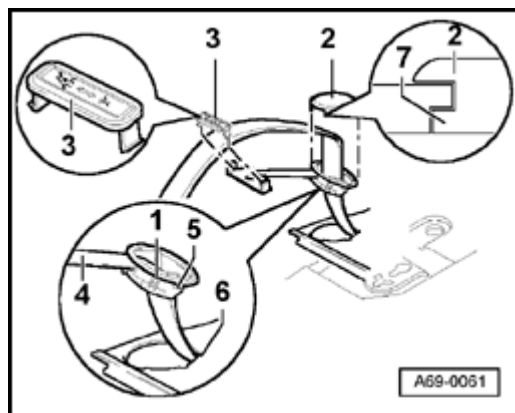


- ⚠ - Use screwdriver to press retaining tab -1- (2x) inward while simultaneously pulling up on belt adjuster -2-.
- Pull belt webbing through belt adjuster -2-.

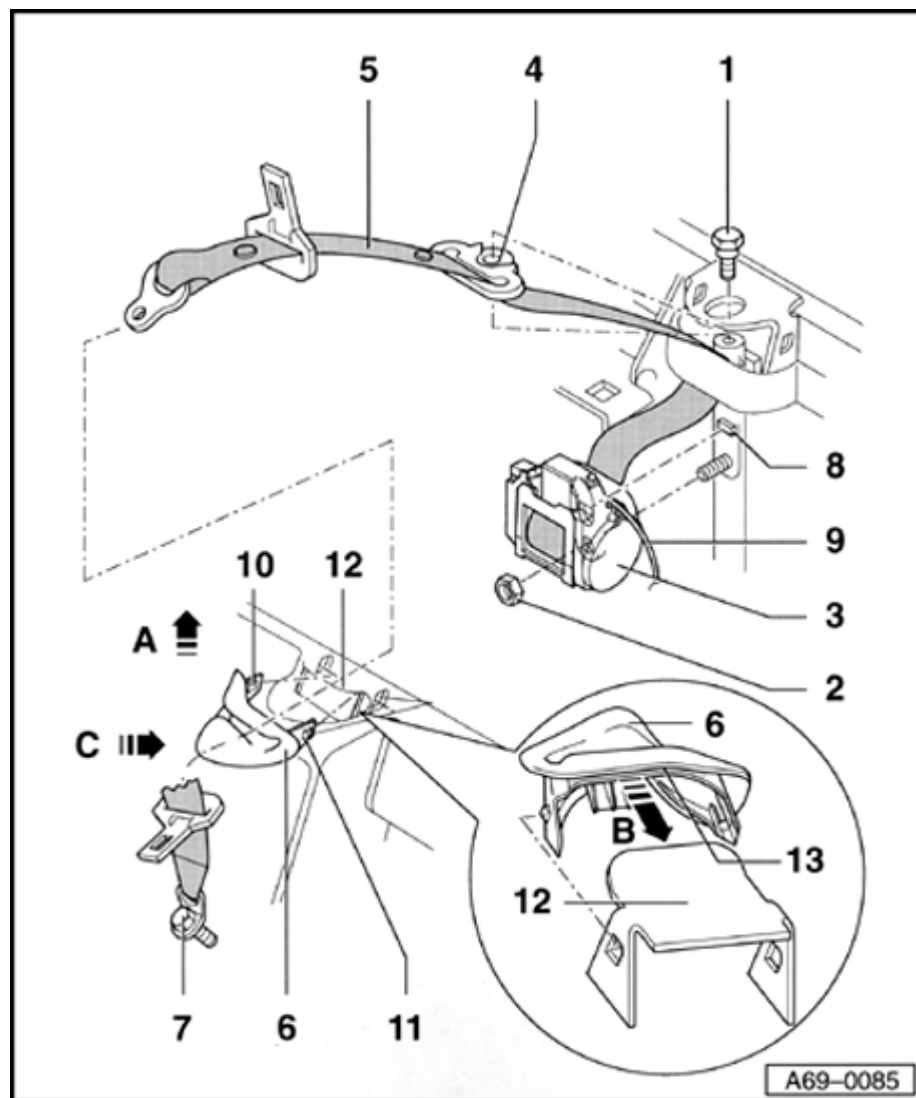
69-21

Installing

4



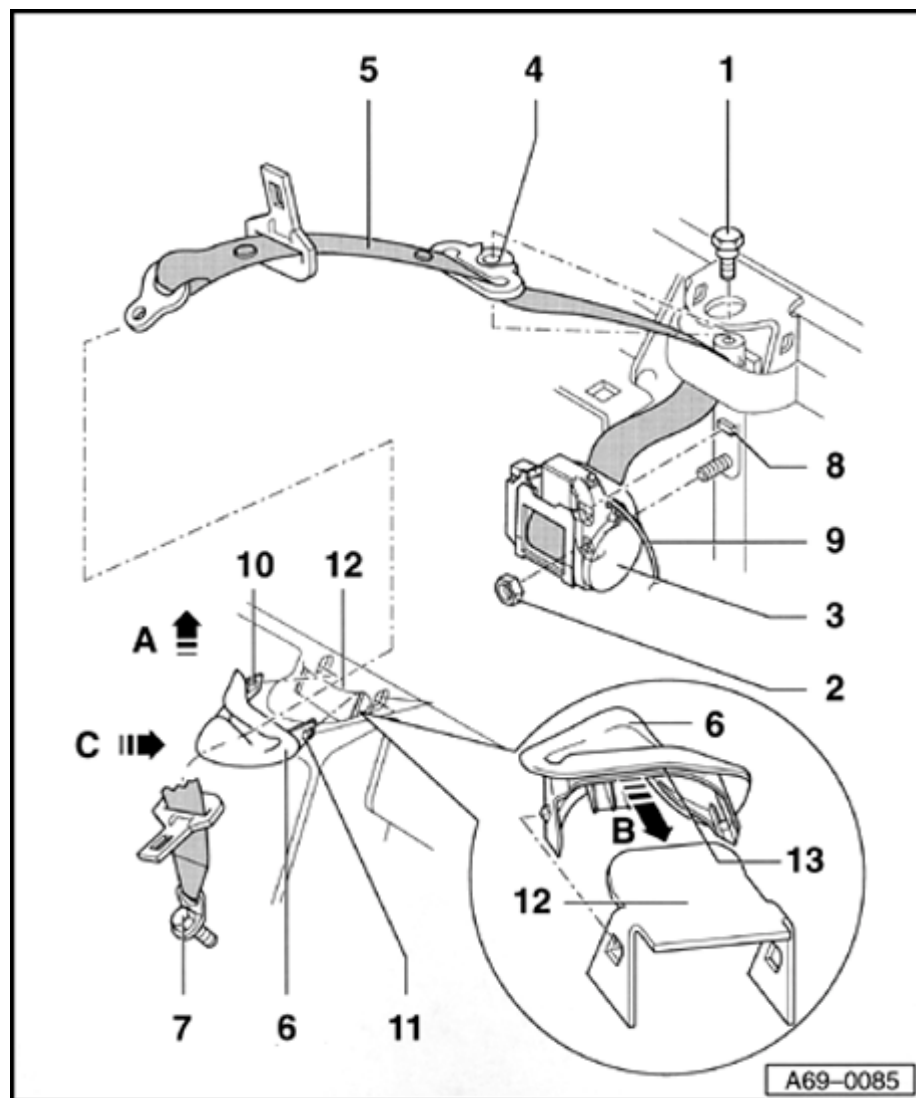
- ◆ Make sure retaining tabs -1- (2x) fully engage.
- ◆ Make sure rear lug engages in notch -6-.
- ◆ Reverse mounting protection -5- must point toward center of vehicle.



Third rear center three-point seat belt (Avant), removing and installing

Removing

- Remove rear seat ⇒ [page 72-57](#) .
- Remove bolt -7-.
- Remove 2/3 seatback (➤ m.y. 97) ⇒ [page 72-62](#) , (m.y. 98 ➤) ⇒ [page 72-64](#) .
- Push cover at belt guide trim -6- to side, and using screwdriver, detach retaining tab -11-.
- Remove cover -6- in direction of arrow -A-.
- Remove padding of 2/3 rear seatback until cover with padding can be removed ⇒ [page 74-37](#) .
- Remove bolt -1- (1x).
- If necessary, disconnect harness connector at belt tensioner.
- Cut tie wrap off belt tensioner igniter wire at belt tensioner.



- Remove nut -2- (1x) and third rear three-point seat belt tensioner -3-.

Installing

- To install belt guide trim -6-, first attach retaining tab -10- and insert, then turn retaining tab -11- inward making sure metal piece -12- is inserted into cutout -13- of belt guide trim -6- (arrow -B- in inset).
- Tap lightly on belt guide trim -6- in direction of arrow -C- to engage.

Vehicles with belt tensioner:

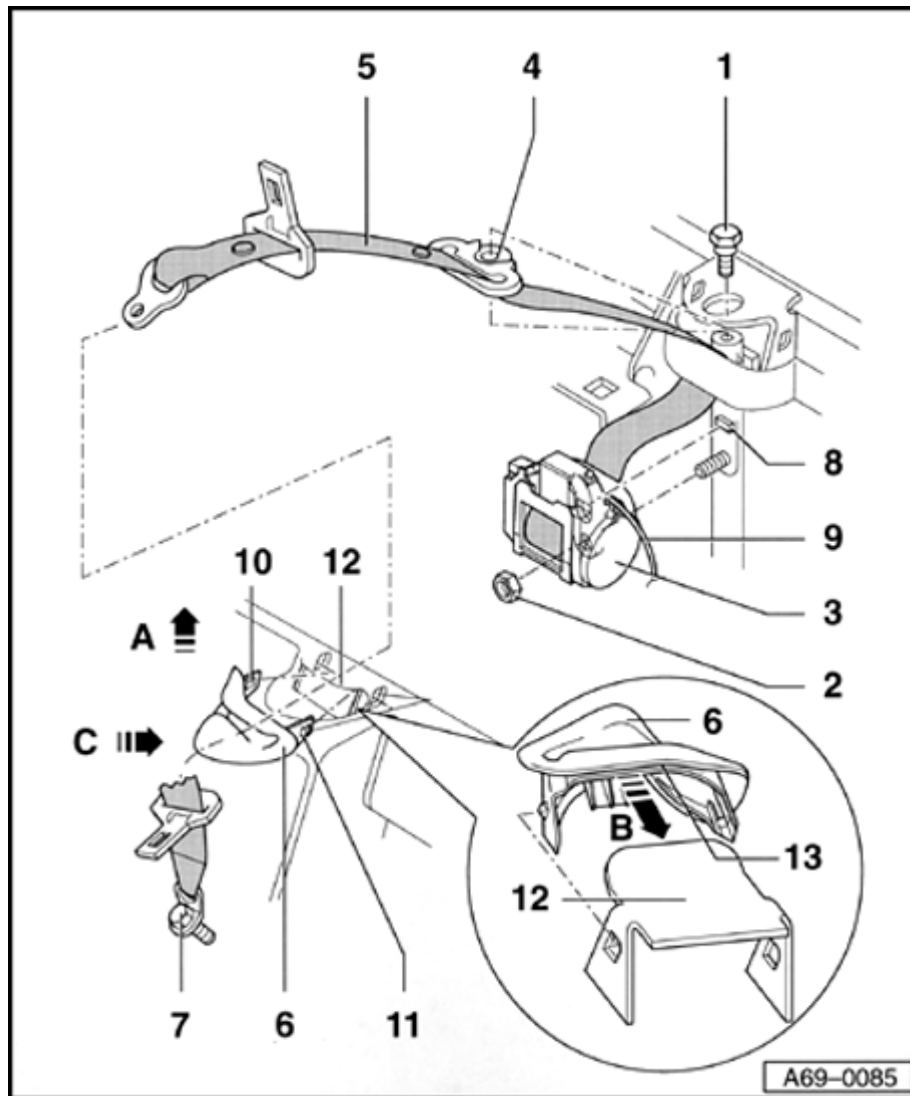
- Check belt-fastened sensor ⇒ [page 69-38](#) .

Notes:

Check the following after full backrest installation:

- ◆ The anti-twist stop -4- and belt webbing -5- must not touch or rub against any foam or cover components.
- ◆ Anti-twist stop -4- must follow all movements of belt webbing.
- ◆ Belt webbing -5- must move freely in all directions.

69-24

**1 - Bolt**

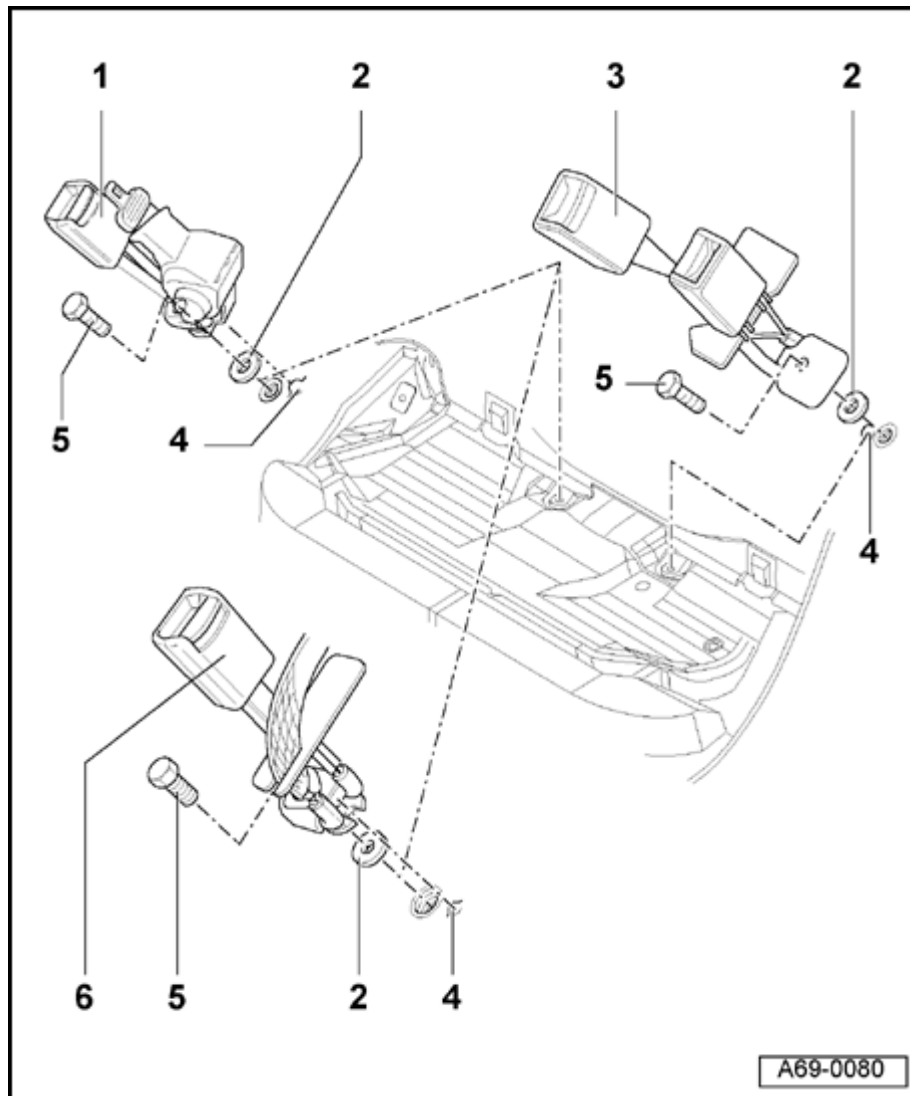
◆ 55 Nm (41 ft lb)

2 - Nut

◆ 55 Nm (41 ft lb)

3 - Belt tensioner**4 - Anti-twist stop****5 - Belt webbing****6 - Belt guide trim****7 - Bolt (1x)****8 - Retaining tab****9 - Harness connector for belt tensioner****10 - Retaining tab****11 - Retaining tab****12 - Bracket on rear backrest****13 - Cutout**

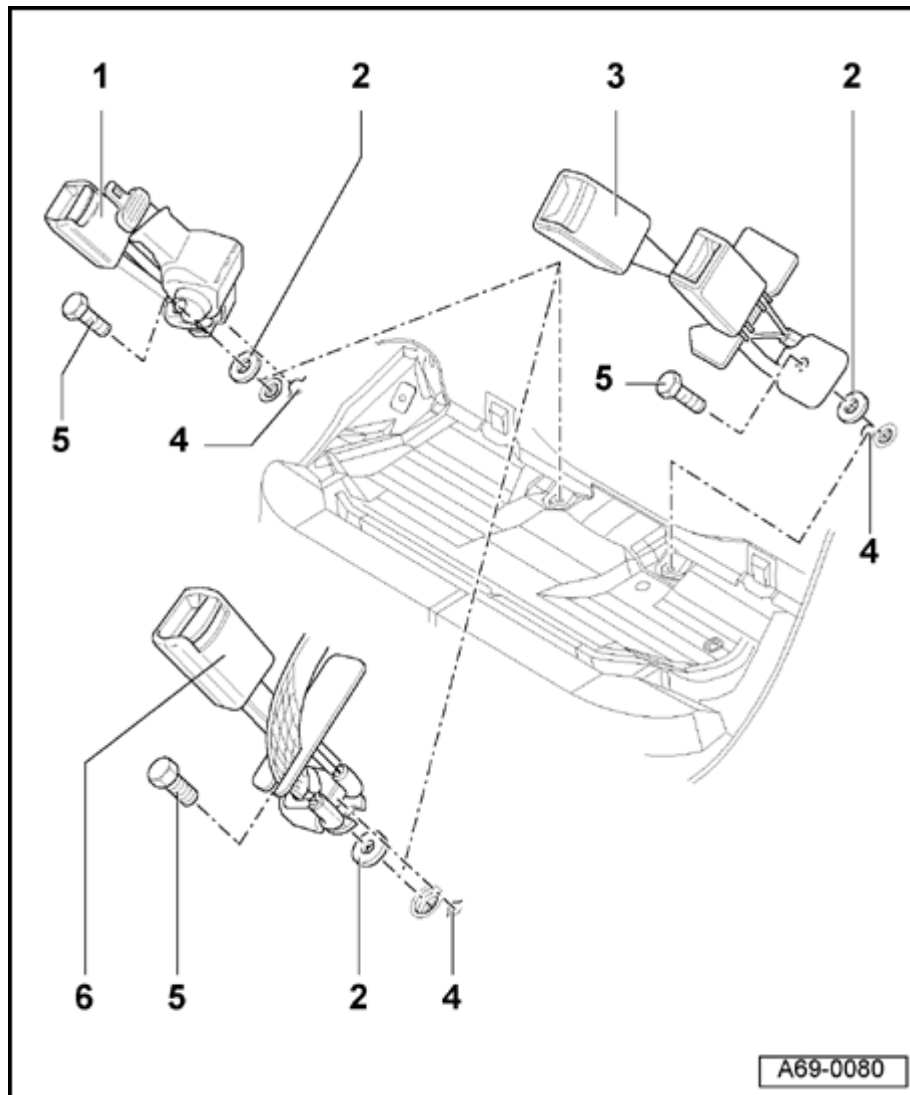
69-25



Center floor panel attachment points

Removing

- Remove rear seat ⇒ [page 72-57](#) .
- Remove bolt -5- (1x).
- ◆ Always change gasket -2-.
- ◆ When installing, make sure buckle and/or lap belt engages in guide knob -4-.
- ◆ Narrow side of buckle and/or lap belt must face in direction of travel.



1 - Lap belt with retractor

Note:

When installing, make sure that bracket is accessible. If necessary, turn lap belt with retractor.

2 - Seal

3 - Buckle

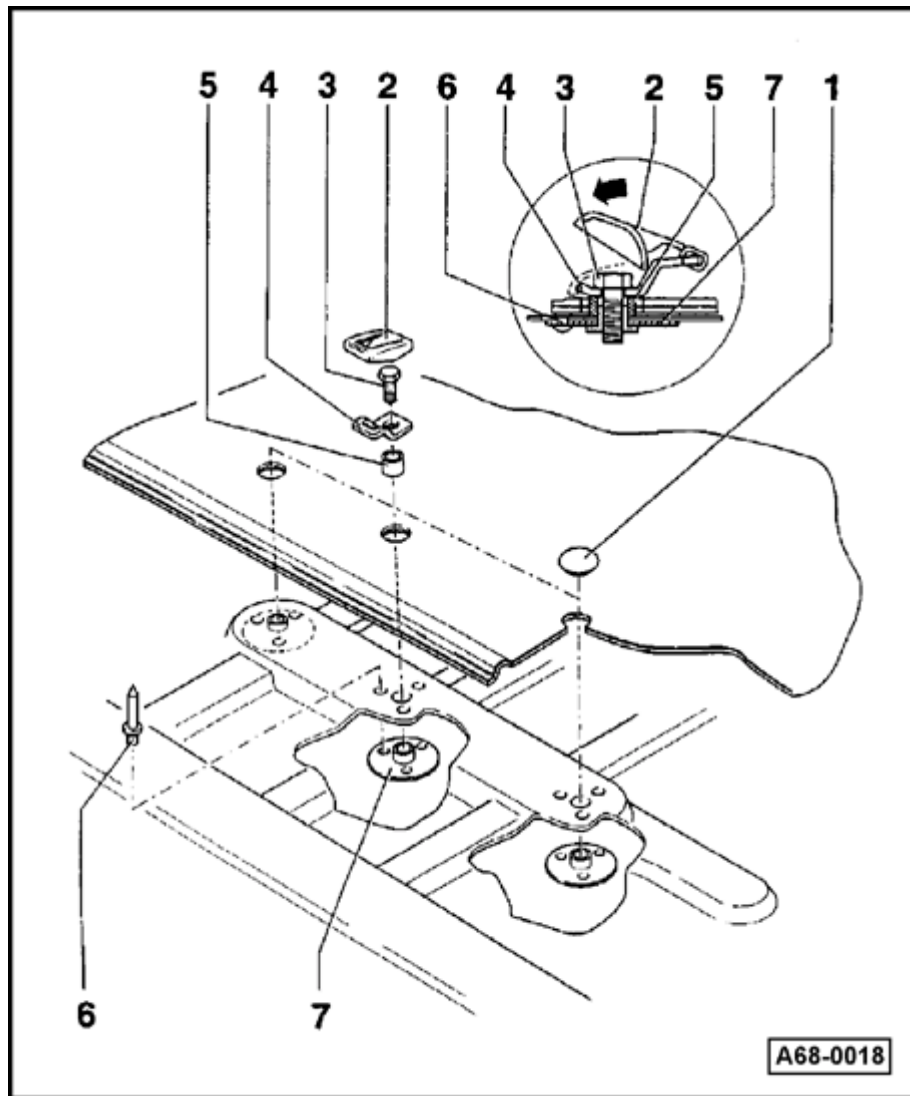
4 - Guide knob

5 - Bolt

◆ 50 Nm (37 ft lb)

◆ Only use genuine Audi replacement bolts

6 - Lap belt



LATCH system, "Lower Anchors and Tethers for Children", installing, removing, retrofitting (Sedan)

Rear upper tethers, installing

Note:

Mountings can be installed for three tether attachment points.

- Remove rear shelf ⇒ [page 70-83](#) .

1 - Cover

2 - Cap

- To install, attach at front and press in direction of arrow and downward.

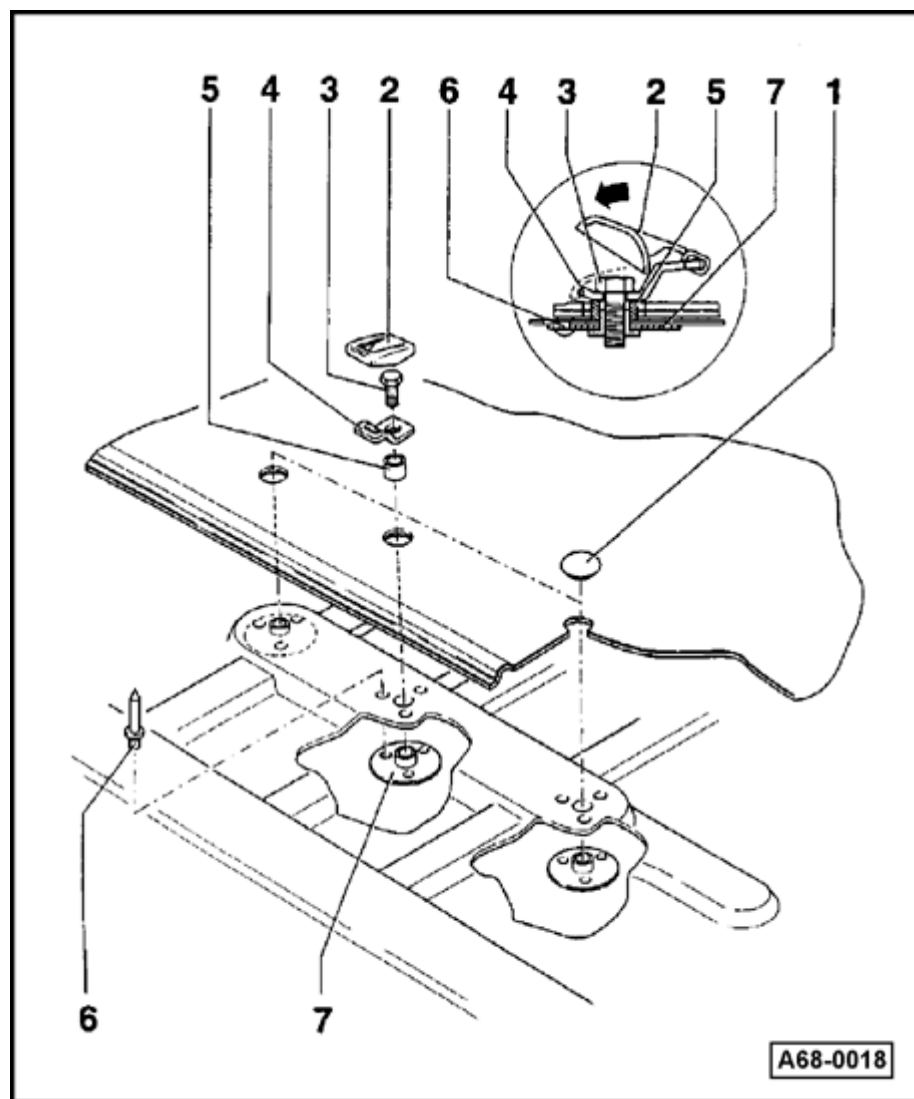
3 - Bolt

- ◆ 23 Nm (17 ft lb)

4 - Attachment point

5 - Spacer

69-28

**6 - Pop rivet**

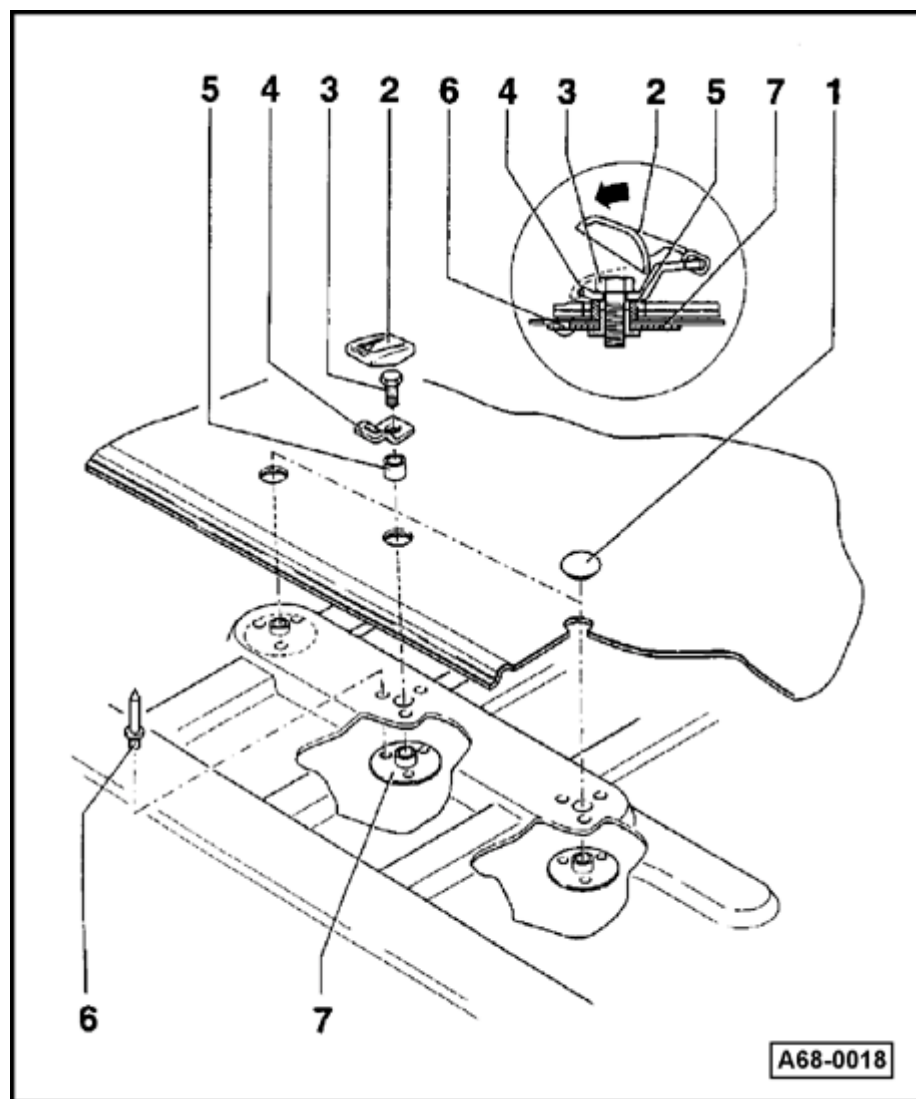
- ◆ Qty: 3 per plate
- ◆ To secure thread washer -7- on metal mounting
- ◆ Riveted from above (interior)

CAUTION!

The thread washer must always be installed from below (trunk side).

7 - Threaded washer

- ◆ Secured on trunk side with pop rivets -6-
- ◆ Threaded insert points upward



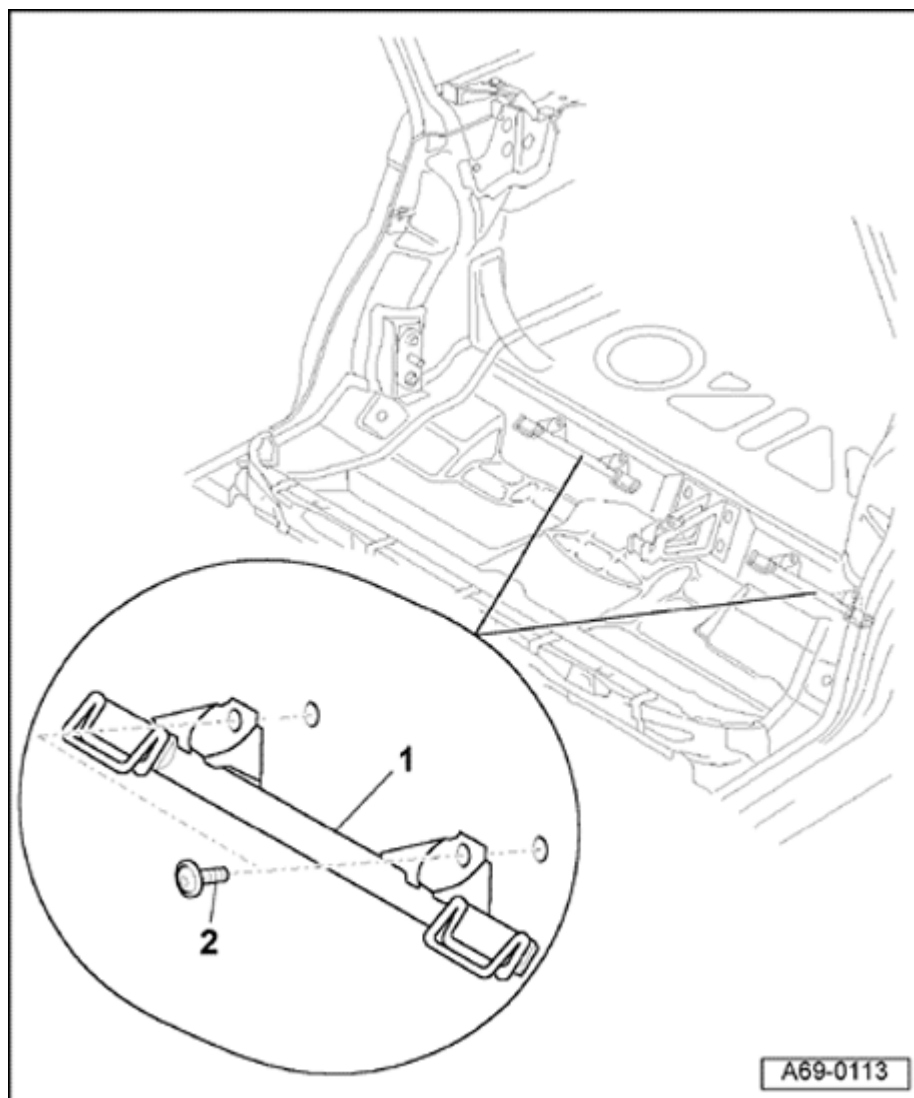
Rear upper tethers, retrofitting

- Beginning in trunk, use felt tip marker to mark center point of center holes (3x).
- Remove rear shelf ⇒ [page 70-83](#) .

CAUTION!

The thread washer must always be installed from below (trunk side).

- Install threaded washer -7- starting from trunk.
- Cut 23 mm hole at each marked point (3x).
- Install rear shelf.
- ◆ 1, 2, or 3 attachment stops can be installed as needed.
- Install spacer sleeve and secure attachment stop with bolt -3-.
- Close other holes using cover -1-.



Rear lower anchors, installing

1 - Rear lower anchor bracket

- Remove rear seat ⇒ [page 72-57](#)
- Disconnect connectors
- Remove bolts -4- (2x).

2 - Bolts (4x)

- ◆ 30 Nm (22 ft lb)
- Mount rear lower anchor bar -1- with bolts -2- fastened into threaded holes in body floor panel.

Notes:

- ◆ To install solid rear backrest, push tabs behind rear lower anchor bracket.
- ◆ If rear lower anchor is retrofitted, it may be necessary to flatten tab in vise down to about 3 mm ⇒ [page 72-58](#)
- ◆ Inside anchors are not recommended for attaching rear lower anchors of a LATCH seat in the middle position. The three-point lap/shoulder belt should be used.

LATCH system, "Lower Anchors and Tethers for CHildren", installing, removing, retrofitting (Avant)

Rear upper tethers

Note:

Some A4 Avant models may require a seat back change for rear top tether installation.

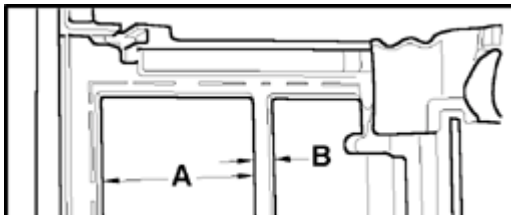
Rear upper tethers (Avant), retrofitting (➤ m.y. 1998)

To retrofit the child seat attachment point on vehicles ➤ m.y. 1998, a backrest from m.y. 1999 or later must be installed.

- Remove old backrest.

⇒ [Repair Manual Body Interior Repair Group 72](#)

1/3 backrest



➤

- Using sharp knife, carefully cut upholstery -1- at width of 30 mm (dimension -B-) down to indentation -2- (dimension -A- = 195 mm when measured from below).

69-32**2/3 backrest**

- Using sharp knife, carefully cut upholstery at reinforcements.

All backrests

- Install new panel on backrest.
 - ◆ Note original color and cargo net version.

Rear upper tethers (Avant), retrofitting (➤ m.y. 1998)

To retrofit the child seat upper tether points on vehicles ➤ m.y. 1998, a backrest from m.y. 1999 or later must be installed.

- Remove old backrest.

⇒ [Repair Manual Body Interior Repair Group 72](#)

1/3 backrest



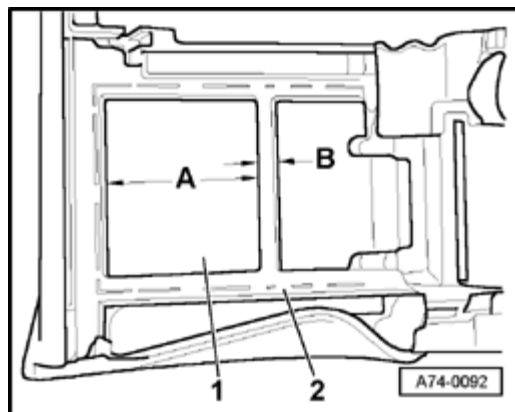
- Using sharp knife, carefully cut upholstery -1- at width of 30 mm (dimension -B-) down to indentation -2- (dimension -A- = 195 mm when measured from below).

2/3 backrest

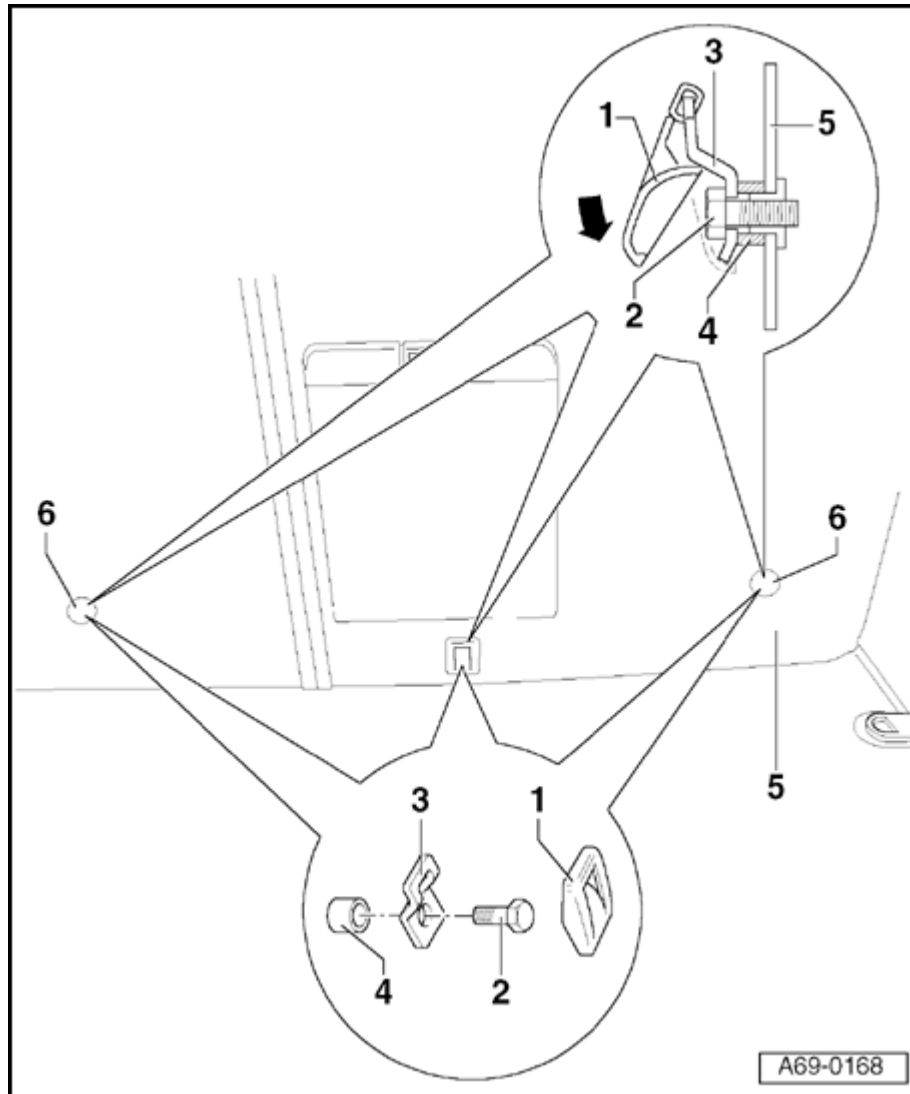
- Using sharp knife, carefully cut upholstery at reinforcements.

All backrests

- Install new panel on backrest.
 - ◆ Note original color and cargo net version.



69-34



Rear upper tethers (Avant), removing and installing (m.y. 1999 ➤)

1 - Cap

- ◆ To install, attach at front and press downward in direction of arrow

2 - Bolt

- ◆ 23 Nm (17 ft lb)

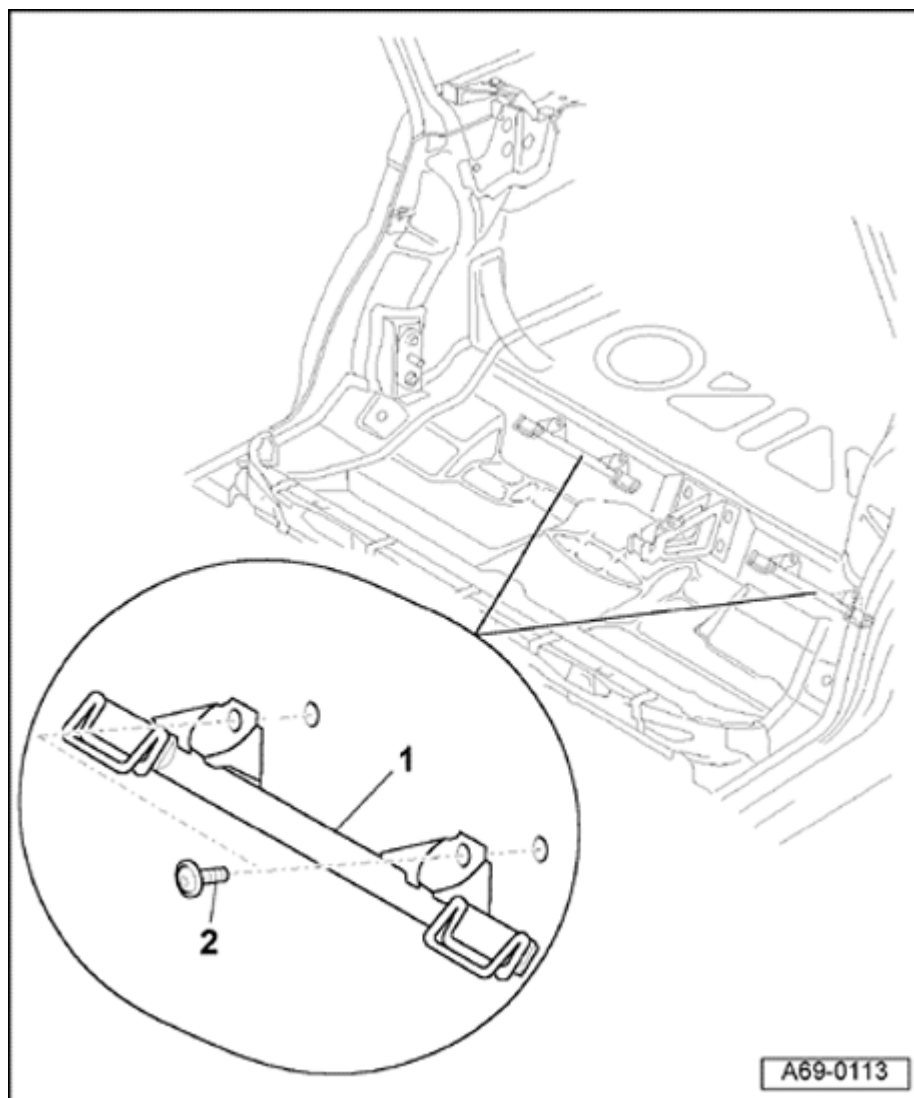
3 - Attachment point

4 - Spacer pulley

5 - Backrest

6 - Plugs

- ◆ Remove if necessary and attach items -1- through -4-



Rear lower anchors, installing

1 - Rear lower anchor bracket

- Remove rear seat ⇒ [page 72-57](#)
- Disconnect connectors
- Remove bolts -4- (2x).

2 - Bolts (4x)

- ◆ 30 Nm (22 ft lb)
- Mount rear lower anchor bar -1- with bolts -2- fastened into threaded holes in body floor panel.

Notes:

- ◆ To install solid rear backrest, push tabs behind rear lower bracket.
- ◆ If rear lower anchor is retrofitted, it may be necessary to flatten tab in vise down to about 3 mm ⇒ [page 72-58](#)
- ◆ Inside anchors are not recommended for attaching rear lower anchors of a LATCH seat in the middle position. The three-point lap/shoulder belt should be used.

Airbags, servicing

Airbag system, safety precautions

WARNING!

- ♦ *Checking, removing, installing and servicing may ONLY be performed by qualified personnel.*
- ♦ *Never perform tests using a test light or multimeter.*
- ♦ *Airbag system may only be tested when installed in vehicle using VAG1551/VAG1552 scan tool.*
- ♦ *Battery must be disconnected before performing any work on airbag system.*
- ♦ *Work can begin immediately after disconnecting the battery.*
- ♦ *When connecting the airbag system to a voltage source, no one should be in the vehicle interior.*
- ♦ *Always install airbag units in the vehicle as soon as they are removed from the*

packaging.

- ♦ *If installation work is interrupted, immediately return the airbag unit to its original packaging.*
- ♦ *NEVER leave an airbag unit unattended.*
- ♦ *After removing from the vehicle, ALWAYS lay the airbag down with impact absorbing pad (padded side) facing up.*
- ♦ *Never attempt to open or service airbag components. Always use new parts.*

WARNING!

- ♦ ***DO NOT install an airbag unit that has fallen on a hard surface or experienced mechanical damage.***
- ♦ ***Airbag units have an expiration date (see sticker on B-pillar). If airbag units are replaced, pull sticker with expiration date off new airbag unit and place it over old sticker on B-pillar. Airbag unit and sticker must be replaced after 14 years.***
- ♦ ***If there is no sticker on the B-pillar, airbag change must be indicated in service plan.***
- ♦ ***Airbag unit must not be treated with grease, cleaners or similar materials and must not be exposed to temperatures above 100 ° C (212 ° F), even for short periods.***

Always use the following work sequence when replacing airbag units:

- 1 - Remove old airbag unit and lay down with padded side facing up, for side curtain airbag, observe additional safety precautions ⇒ [page 69-49](#) .

2 - Remove new airbag unit from transport container and lay down with padded side facing up, for side curtain airbag observe additional safety precautions ⇒ [page 69-49](#) .

3 - Immediately place old airbag in transport container.

4 - Install new airbag in vehicle.

Airbag units, replacing after an accident

Accident with activation of airbag and belt tensioners (up to and including airbag 7)

Airbag control module must be replaced after every activation of airbag and belt tensioners

Accident with activation of airbag and belt tensioners (for airbag 8) (integrated as of 10/98)

Notes:

- ◆ *For vehicles with airbag 8, display will indicate airbag front and side or airbag front and side curtain.*
- ◆ *Airbag control module can be used for up to three side-/side curtain airbag and/or belt tensioner activations.*
- ◆ *After the third activation, the DTC "Control Module Malfunctioning" will appear.*

Airbag control module must be replaced:

- ◆ *After driver-side and/or passenger-side airbag deployment.*

- ◆ If housing is damaged.
- ◆ If there is a deformation of body channel, within a circumference of 200 mm around control module.
- ◆ After three side-/side curtain airbag deployments.

All models**Always replace any deployed airbag unit and the following**

Also replace the following if passenger-side airbag deployed:

- ◆ Flap and mounting frame for airbag (do not reshape deformed mounting frames) and instrument panel (if damaged).
- ◆ Lateral acceleration sensor (if floor pan in area near sensor is deformed).

Also replace the following if driver-side airbag deployed:

- ◆ Spiral spring with slip ring.
- ◆ Lateral acceleration sensor (if floor pan in area near sensor is deformed).

Also replace the following if side airbag deployed:

- ◆ Lateral acceleration sensor for the deployed side airbag.

- ◆ Seatback cushion.
- ◆ Backrest cover.
- ◆ Lateral acceleration sensor that hasn't been activated (if area near it in floor pan has been deformed).

Also replace the following if side curtain airbag deployed:

- ◆ Acceleration sensor for deployed side airbag.
- ◆ Molded headliner.
- ◆ Trim panels at A-pillar, B-pillar, C-pillar and D-pillar.
- ◆ Acceleration sensor that hasn't been activated (if floor pan in area near sensor is deformed).

Also

All seatbelts with activated belt tensioners.

On Board Diagnostic will recognize if belt tensioners have been activated for airbag V, 7 and 8.

A - if airbag control module has been triggered:

Front seat belt tensioners:



- Read Measuring Value Block display group 1:

⇒ [Repair Manual, Body On Board Diagnostic \(OBD\), Repair Group 01](#)

Activated belt tensioners can be identified by "0111" or "too large" indicated on display.

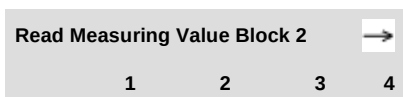
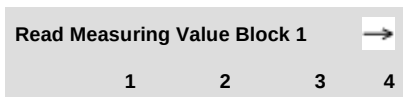
Rear seat belt tensioners:



- Read Measuring Value Block display group 2:

⇒ [Repair Manual, Body On Board Diagnostic \(OBD\), Repair Group 01](#)

Activated belt tensioners can be identified by "0111" or "too large" indicated on display.



B - If airbag control module is replaced:

- Check DTC memory:

⇒ [*Repair Manual, Body On Board Diagnostic \(OBD\), Repair Group 01*](#)

Activated belt tensioners can be identified by the DTC: "Ignitor for belt tensioner - resistance is too high"

- If necessary (visual check) also replace: all damaged components.

Accident without airbag deployment

If airbag Malfunction Indicator Lamp (MIL) -K75- does not indicate a DTC, then airbag components do not need to be replaced. Check seat belts separately.

After replacing airbag units or the control module, attach label (only tear-off strip) to registration card and send in registration card.

Airbag system side airbags, safety precautions

WARNING!

- ♦ *Checking, removing, installing and servicing may ONLY be performed by qualified personnel.*
- ♦ *Following the same safety precautions as for driver and passenger-side airbags.*
- ♦ *Only use original equipment seat covers and backrest covers that are approved for use with side airbags (identified by a label on the fabric).*
- ♦ *Do not use extra seat covers over the seat as they interfere with proper side airbag operation.*
- ♦ *Do not use seat cushion supports, mats or similar since they impare seat occupant sensor and airbags*

Note:

The driver's seat does not have a seat occupant sensor.

WARNING!

- ♦ *For vehicles without heated seats, a dummy seat heating element is installed (heating element without heating wire).*
- ♦ *The seat backrest foam must not be cut out in the area of the side airbag.*
- ♦ *When installing, seam near side airbag must be straight.*

WARNING!

- ♦ *All upholstery clips must be replaced (metal and plastic clips).*
- ♦ *Only use genuine Audi replacement upholstery clips.*
- ♦ *When installing, all upholstery clips must be installed at the same location from which they were removed.*
- ♦ *If the seat cover is damaged (rips, burn holes etc) near the side airbag, always replace the seat cover to ensure proper side airbag inflation.*
- ♦ *Seat cover may not be repaired in the area near the side airbag (special thread and an exact seam are used).*
- ♦ *Always replace seat cover if side airbag has deployed.*
- ♦ *All damaged components must be replaced after an accident. If no damage to the airbag unit is found, the airbag unit can be reused.*

- ♦ *Side airbag units have an expiration date (see sticker on B-pillar). If side airbag units are replaced, pull sticker with expiration date off new side airbag unit and place it over old sticker on B-pillar. Replace side airbag unit and sticker after 14 years.*
- ♦ *If there is no sticker on the B-pillar, airbag change must be indicated in service plan.*
- ♦ *If side airbag unit is replaced, pull airbag number sticker off side airbag unit and stick it to the seat pan.*
- ♦ *Do not use a needle or other sharp objects to poke around area near airbag and sensor mat.*

Additional safety precautions for side curtain protection airbag

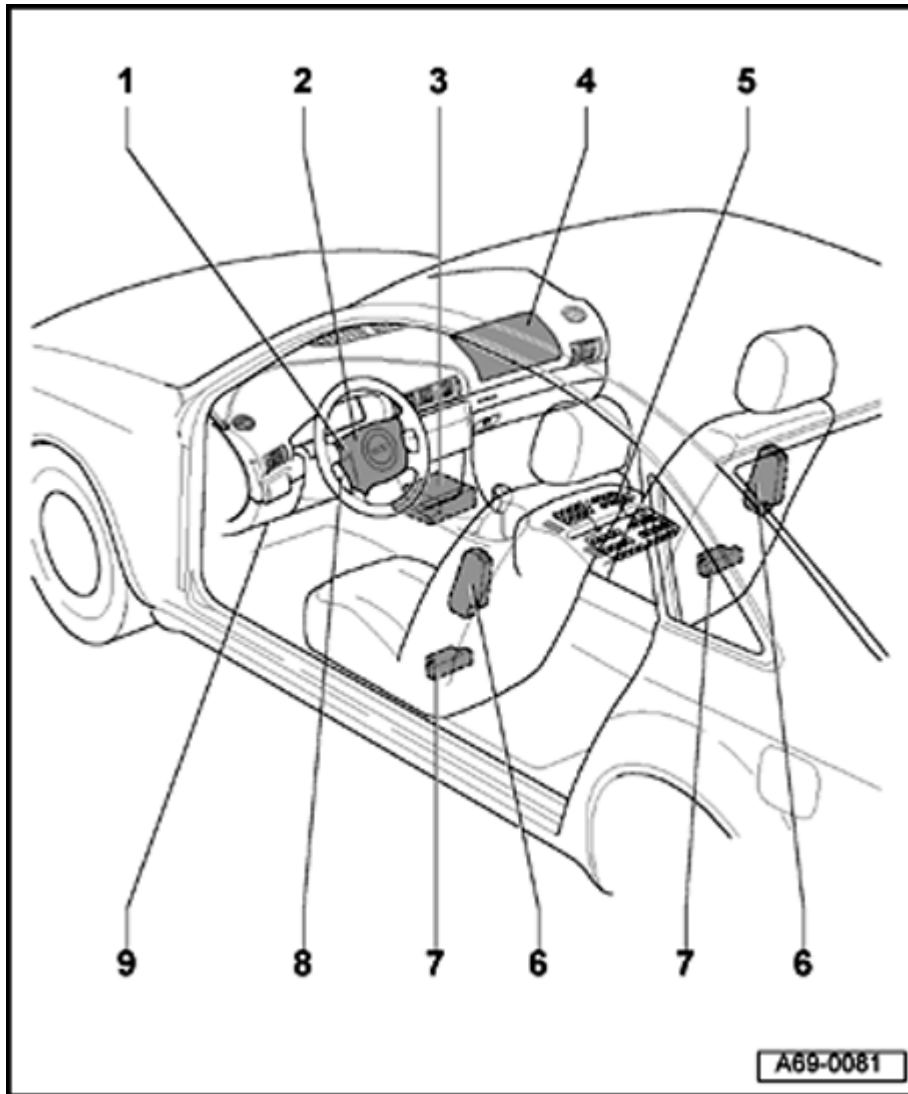
WARNING!

All safety precautions for the driver and passenger-side airbags apply, as well as the following:

- ♦ *Visually check the vehicle's trim panels for damage before every installation.*
- ♦ *Do not attempt any repair work on the vehicle trim panels (top trim panels for A-pillar, B-pillar, C-pillar and D-pillar).*
- ♦ *Make sure the trim panel is securely fitted during installation.*
- ♦ *Side curtain airbags must only be folded at its intended location (transition of roof to A-pillar).*
- ♦ *To carry out repairs behind the side curtain airbag, always remove the entire unit first.*
- ♦ *After removal, always carry the side curtain airbag in the folded position.*

WARNING!

- ♦ *After removal, place the side curtain airbag into the transport container in the folded position or lay on a clean, even surface (on a blanket or in the luggage compartment).*
- ♦ *After servicing the body of vehicle in vicinity of airbag, check the body for welding beads, deformations and chafe marks (compare to opposite side of the vehicle).*
- ♦ *Always hold the side curtain airbag securely.*
- ♦ *After removal, always fold the side curtain airbag and grasp by the igniter (thumbs toward E-connection).*
- ♦ *Always keep one hand on the igniter.*
- ♦ *Never twist, wind, bend, throw, spin, pull, hang, squeeze, press, pinch or clamp the side curtain airbag.*
- ♦ *If any contamination penetrates into the fabric (i.e. oil, grease, lacquer, paint or solvent), the unit must always be replaced.*



Airbag component locations, overview

1 - Driver-side airbag unit

- ◆ Removing ➤ m.y. 1998 ⇒ [page 69-53](#)
- ◆ Removing m.y. 1998 ➤ ⇒ [page 69-54](#)

2 - Driver-side airbag unit (sport steering wheel)

- ◆ Removing ➤ m.y. 1998 ⇒ [page 69-58](#)
- ◆ Removing m.y. 1998 ➤ ⇒ [page 69-61](#)

3 - Airbag control module -J234-

- ◆ Removing and installing ⇒ [page 69-74](#)

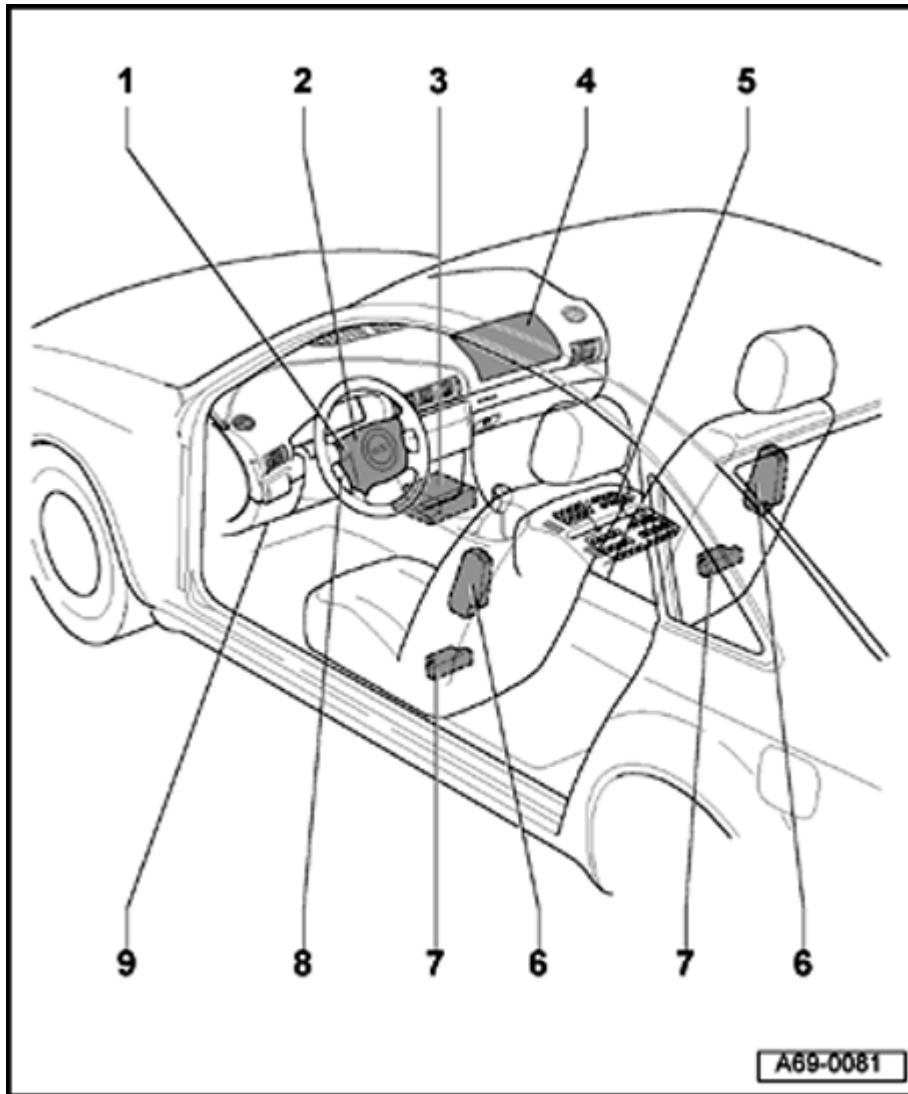
4 - Passenger-side airbag unit

- ◆ Removing ⇒ [page 69-70](#)
- ◆ Locking and activating (adaptation)

⇒ [Repair Manual, Body On Board Diagnostic \(OBD\), Repair Group 01](#)

5 - Seat occupant sensor

- ◆ Removing and installing ⇒ [page 69-83](#)



6 - Side airbag

- ◆ Removing and installing ⇒ [page 69-75](#)

7 - Crash sensor for side airbag

- ◆ Removing and installing ⇒ [page 69-85](#)

8 - Spiral spring

- ◆ Removing and installing ➤ m.y. 1998 ⇒ [page 69-64](#)
- ◆ Removing and installing from sport steering wheel ➤ m.y. 1998 ⇒ [page 69-67](#)
- ◆ Removing and installing m.y. 1998 ➤ ⇒ [page 69-68](#)

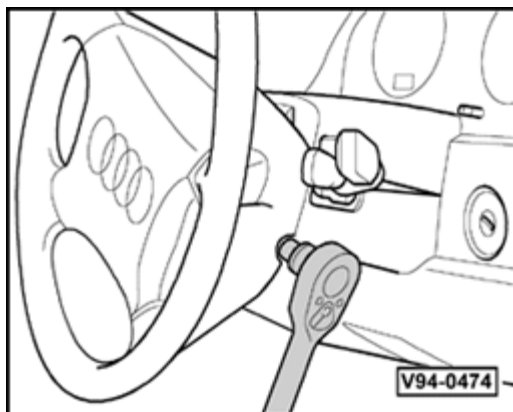
9 - Data Link Connector (DLC)

Driver-side airbag unit (➤ m.y. 1998), removing and installing

- Disconnect battery Ground (GND) strap.

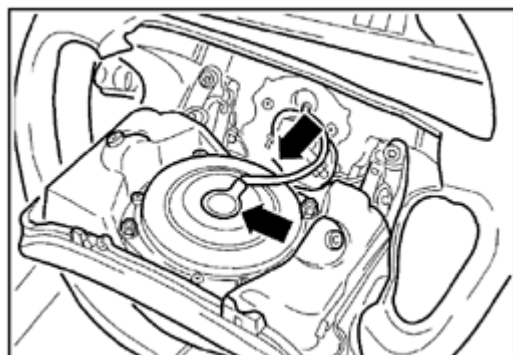
Note:

Always follow airbag safety precautions when working on airbag system components (⇒ [page 69-40](#)).



➤

- Using T30 Torx[®] bit, unbolt airbag unit on both left and right side of steering wheel.
Tightening torque: 6 Nm (53 in. lb)
- Carefully pull back airbag unit.
- Disconnect harness connector from airbag unit.



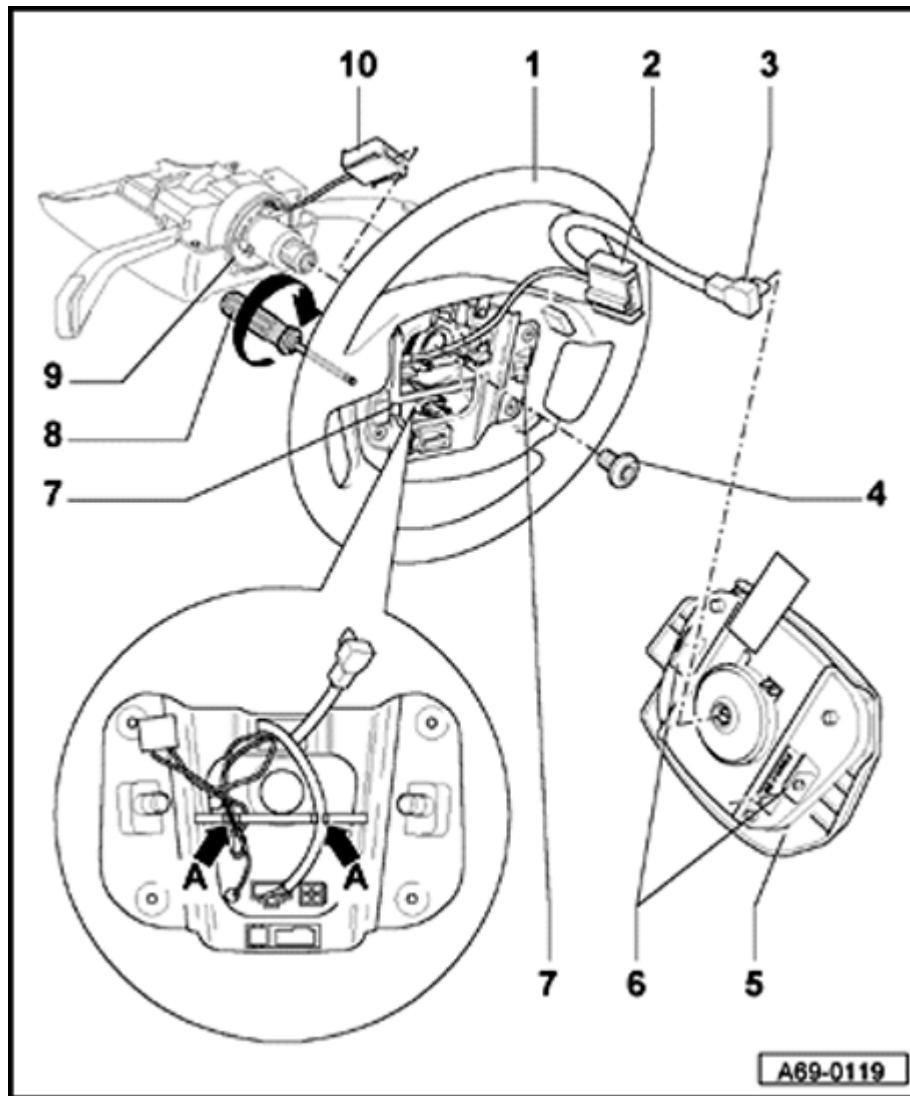
➤

- Place airbag unit on suitable surface with impact padding facing up.
- When installing, make sure harness connector audibly engages (clicks).

WARNING!

No one may be in vehicle when connecting battery Ground (GND) strap.

- Switch ignition on and connect battery Ground (GND) strap.



Driver-side airbag unit (m.y. 1998 ➤), removing and installing

WARNING!

Follow all safety precautions when working on the airbag ⇒ [page 69-40](#) .

1 - Steering wheel

◆ Removing ⇒ [page 69-57](#)

- Secure loose cable at location indicated by arrow -A-.

2 - Harness connector for spiral spring

3 - Harness connector for airbag unit

4 - Multipoint socket

◆ Always replace

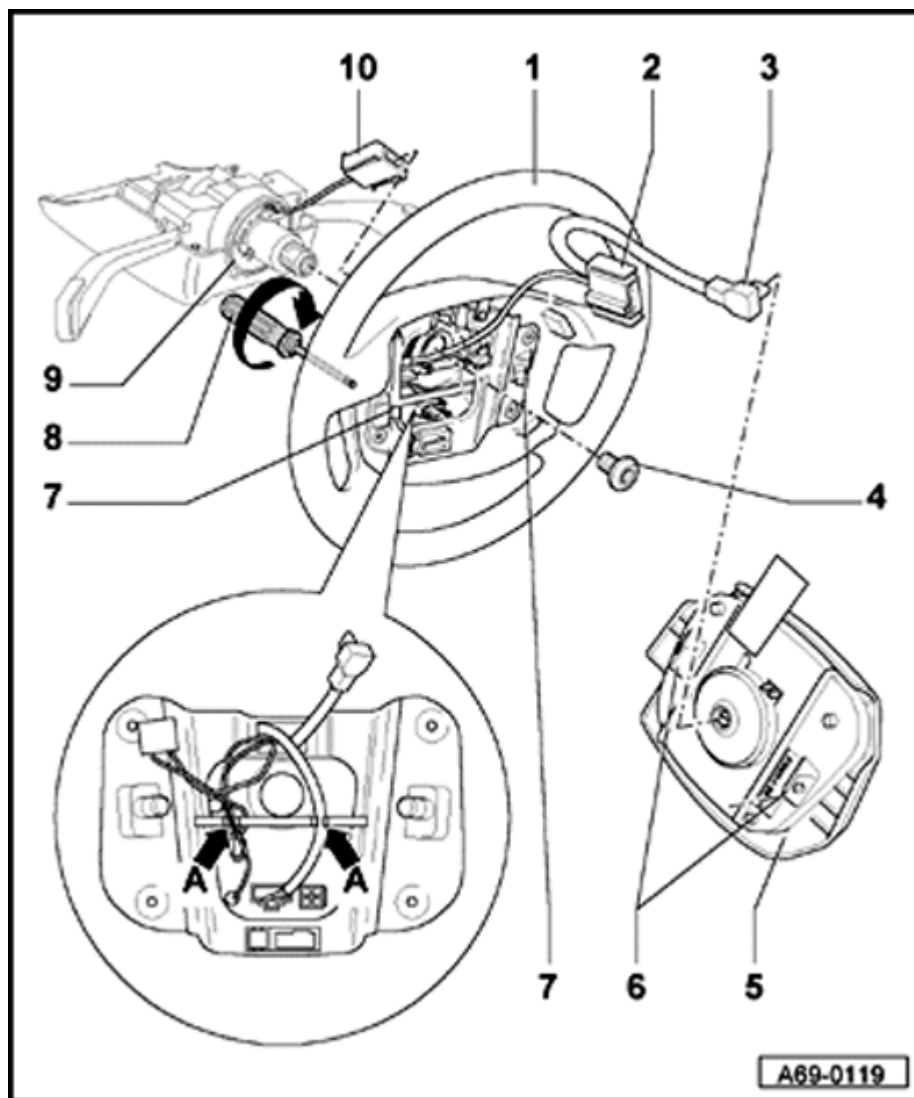
◆ 60 Nm (44 ft lb)

5 - Airbag unit

6 - Threaded bushing

7 - Torx® bolt (T30)

8 - Torx® wrench (T30)



9 - Spiral spring

10 - Harness connector for heated steering wheel

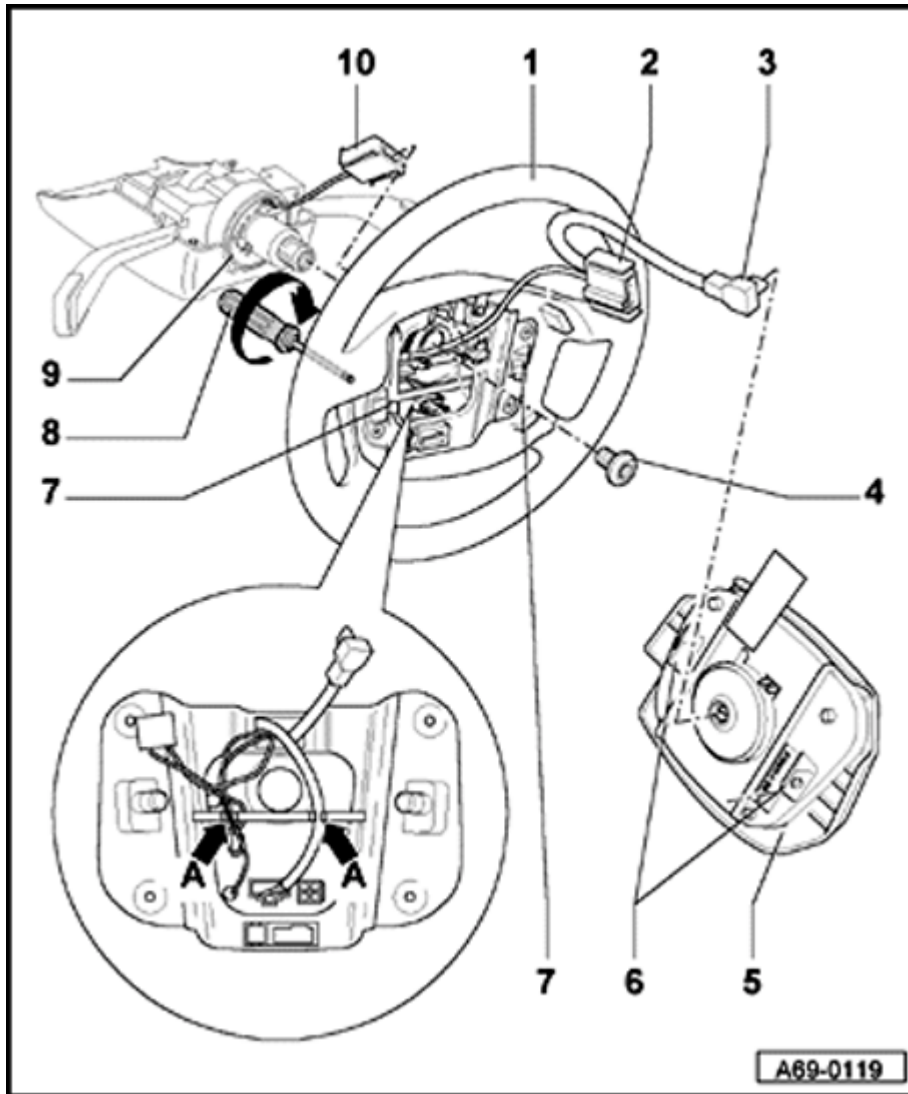
Removing

WARNING!

Follow all safety precautions when working on airbag ⇒ [page 69-40](#) .

- Release steering wheel adjuster.
- Pull steering wheel as far out and up as possible.
- Place steering wheel vertical.
- Remove Torx[®] bolt (T30).
- Turn steering wheel 1/2 turn (180°) back and remove second Torx[®] bolt (T30).
- Pull connector - 3 - from airbag unit.
- Place airbag unit on appropriate surface with impact padding facing up.

69-56



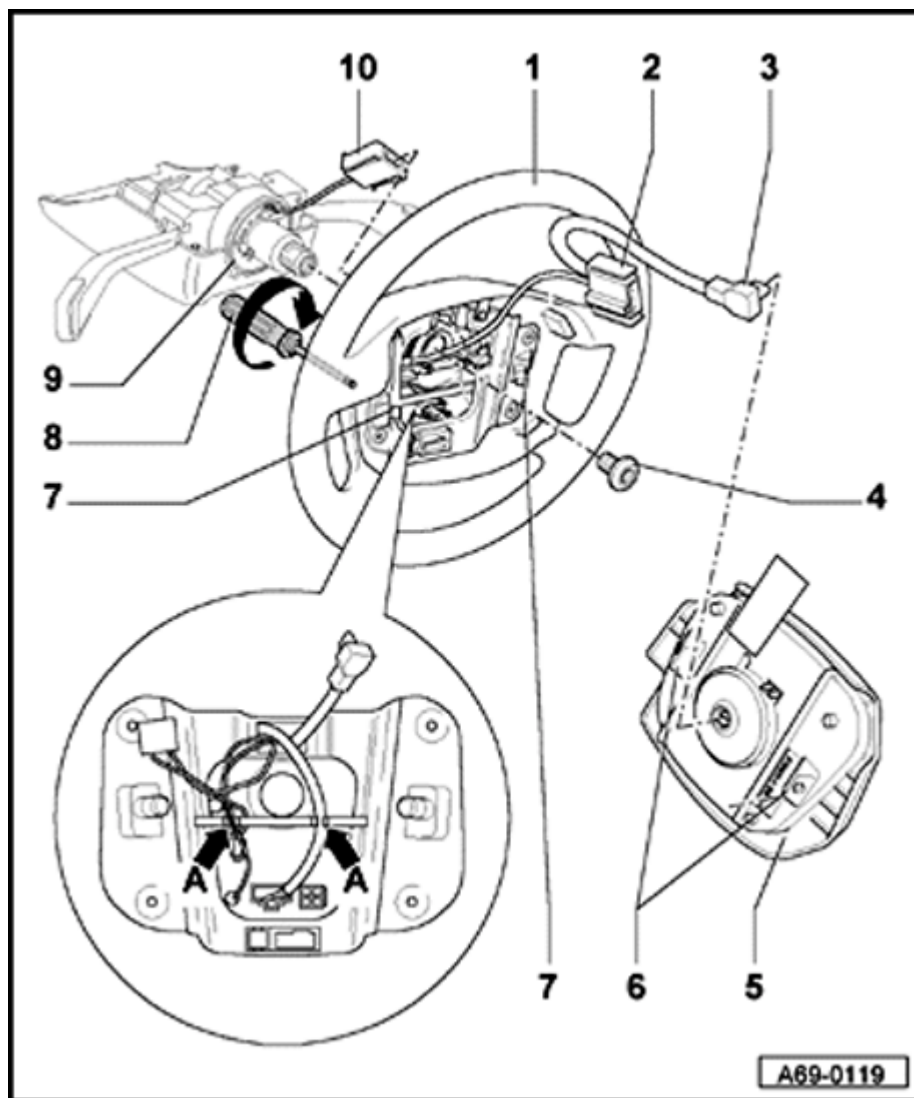
Installing

- When installing, make sure connector audibly engages (clicks).

WARNING!

Make sure no one is in vehicle.

- Switch ignition on and connect battery Ground (GND) strap.



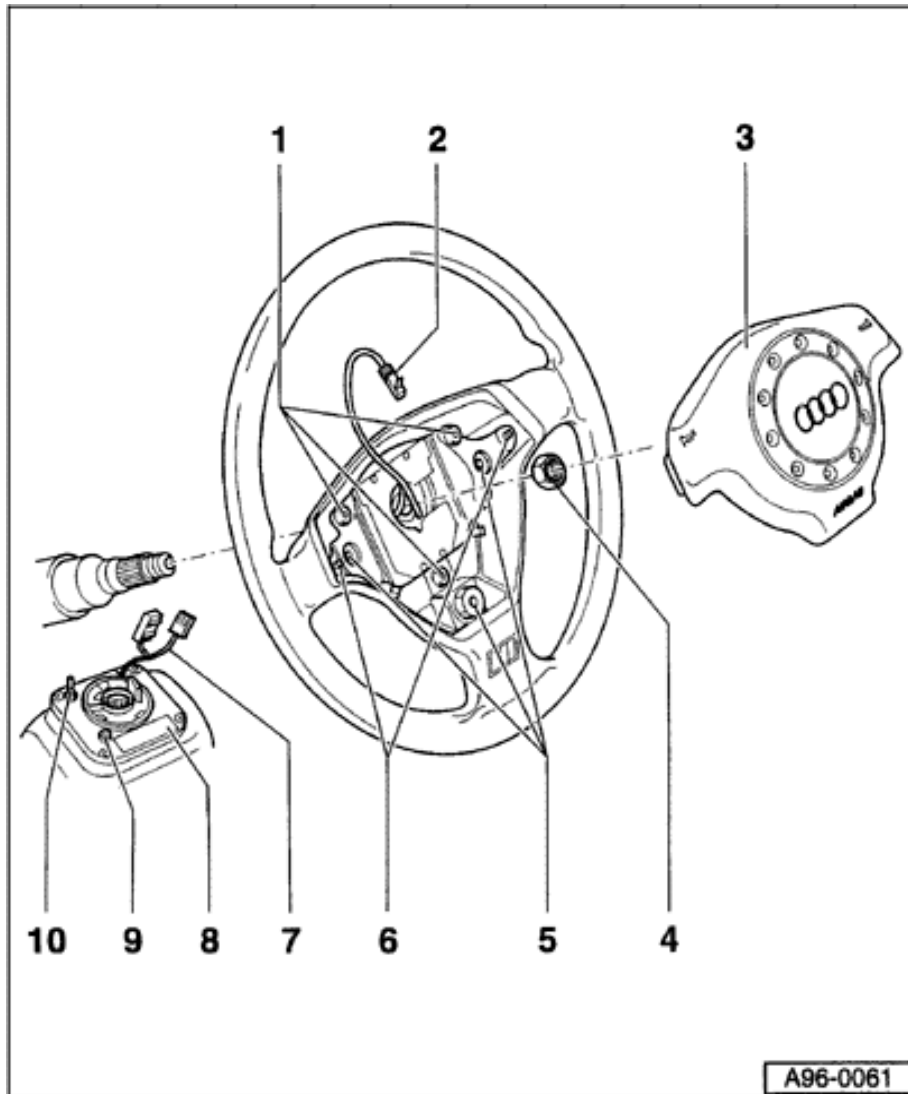
Steering wheel, removing and installing

Removing

- Remove airbag unit ⇒ [page 69-54](#) .
- Center steering wheel (wheels are straight).
- Remove bolt - 4 - .
- Disconnect harness connectors - 2 - and - 10 - .

Installing

- Center steering wheel (wheels straight).
- When installing, make sure harness connectors audibly engage (click).
- Replace bolt - 4 - and tighten to 60 Nm (44 ft lb).
- Install airbag unit ⇒ page ⇒ [Page 69-54](#) .

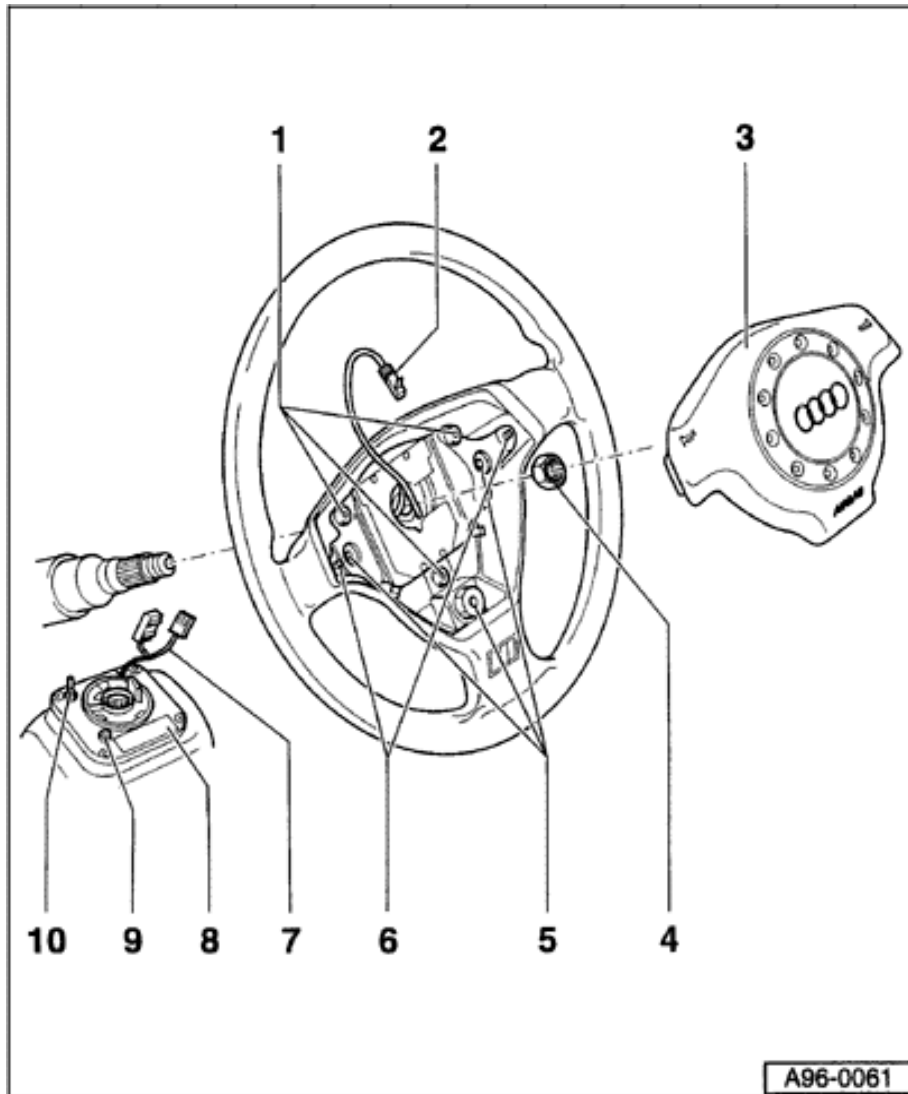


Driver-side airbag for sport steering wheel (➤ m.y. 1998), removing and installing

WARNING!

Follow all safety precautions when working on airbags ⇒ [page 69-40](#) .

- 1 - Bolts to secure upper part of carrier unit**
 - ◆ 5 Nm (44 in. lb)
- 2 - Harness connector for airbag unit**
- 3 - Airbag unit**
- 4 - Nut for steering wheel**
 - ◆ 42 Nm (31 ft lb)
- 5 - Bolts to secure lower part of carrier unit.**
 - ◆ 5 Nm (44 in. lb).
- 6 - Torx[®] bolt (T30)**
 - ◆ 6 Nm (53 in. lb)
- 7 - Securing cable for spiral spring**



8 - Spiral spring

9 - Journal

10 - Transportation protection

Removing

- Unbolt airbag unit from behind using Torx[®] wrench (T30).
- Remove airbag unit -3- and disconnect harness connector -2-.
- Place airbag unit on appropriate surface with impact padding facing up.

Installing

Notes:

- ◆ Make sure harness connector -2- audibly engages (clicks).
- ◆ When installing airbag unit, first tighten right Torx[®] bolt.

WARNING!

Make sure no one is in vehicle.

- Switch ignition on and connect battery Ground (GND) strap.

Airbag sport steering wheel, retrofitting

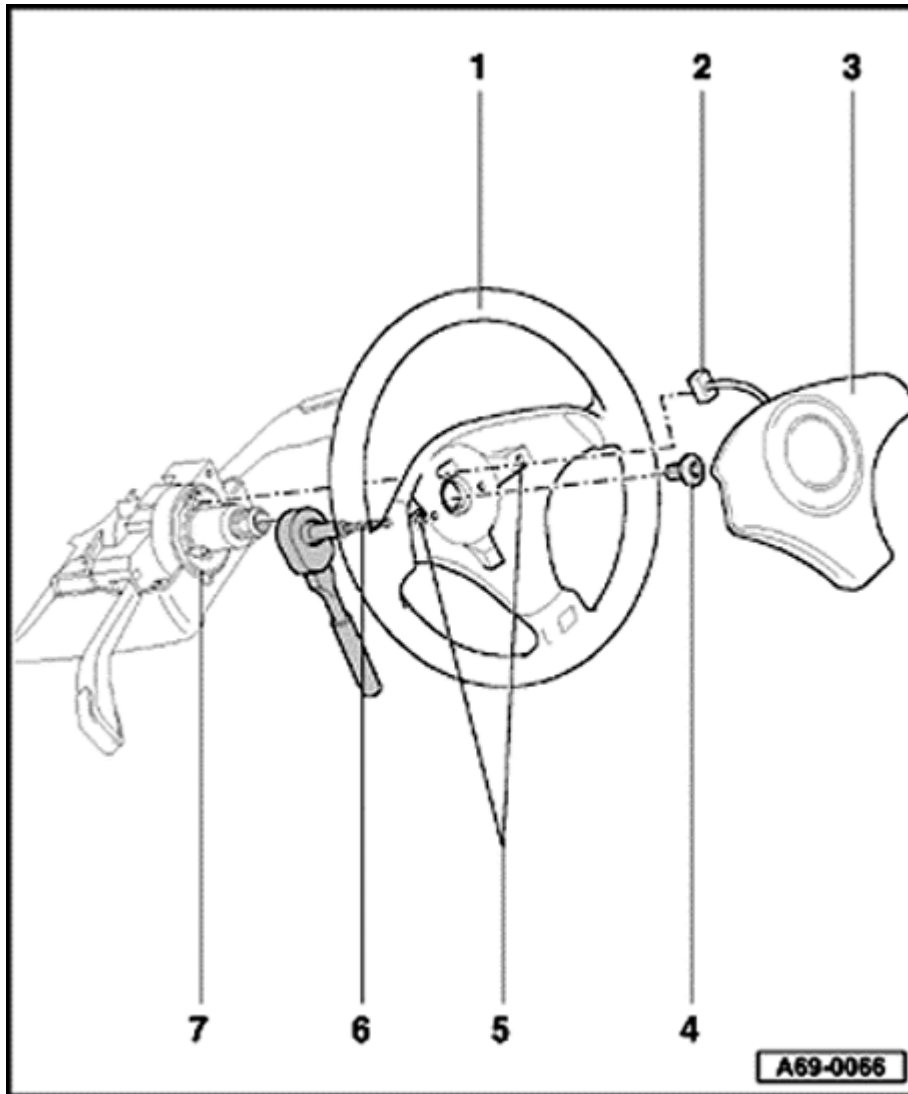
For vehicles m.y. 1995 ➤ that were equipped with an airbag as standard equipment, an Audi dealer can retrofit the vehicle with an airbag sport steering wheel.

The following components are required: airbag sport steering wheel, airbag unit and applicable label for the vehicle (e.g. S4).

Remove the sticker with the expiration date from the new airbag unit and apply it to the airbag identification plate on the lower driver-side B-pillar.

If the vehicle does not have a label, note airbag replacement in the maintenance plan.

69-61



Driver-side airbag for sport steering wheel (m.y. 1998 ➤), removing and installing

WARNING!

Follow all safety precautions when working on airbags ⇒ [page 69-40](#) .

1 - Sport steering wheel

- ◆ Removing ⇒ [page 69-63](#)

2 - Harness connector for spiral spring

3 - Airbag unit

4 - Multipoint socket

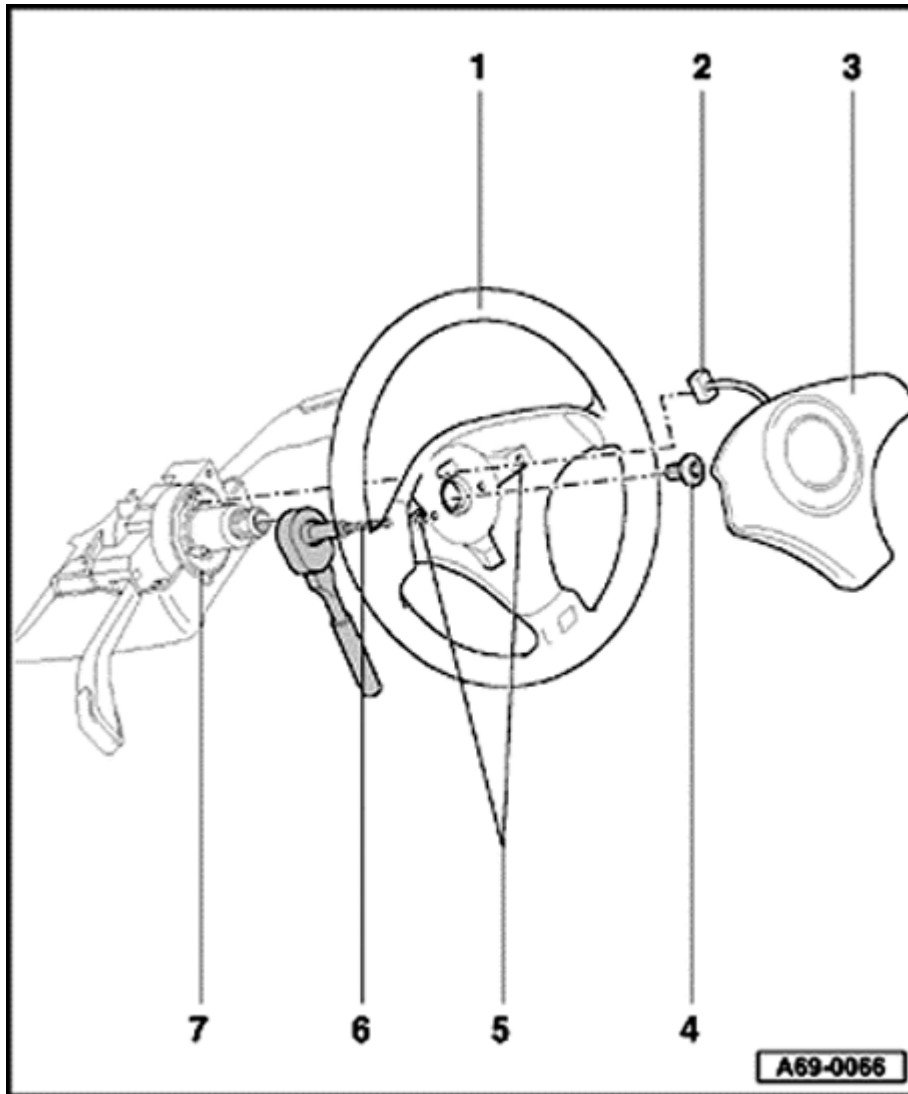
- ◆ Always replace
- ◆ 60 Nm (44 ft lb)

5 - Torx® bolt (T30)

- ◆ 7 Nm (62 in. lb)

6 - Torx® wrench (T30)

7 - Spiral spring



Removing

WARNING!

Follow all safety precautions when working on airbags ⇒ [page 69-40](#) .

- Unbolt airbag unit using Torx[®] wrench (T30).
- Disconnect harness connector - 2 -.
- Place airbag unit on appropriate surface with impact padding facing up.

Installing

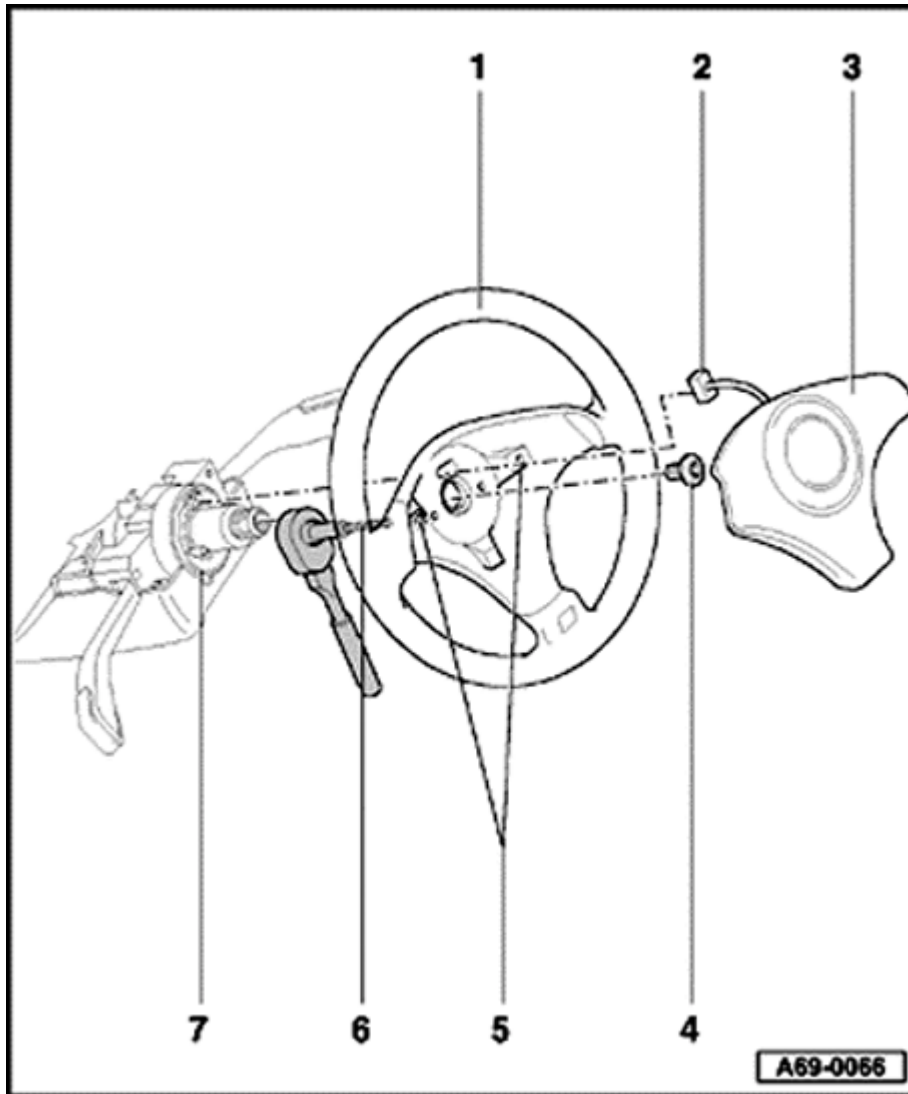
- Make sure harness connector - 2 - audibly engages (clicks).
- Install airbag unit and tighten to 7 Nm (62 in. lb).

WARNING!

Make sure no one is in vehicle.

- Switch ignition on and connect battery Ground (GND) strap.

69-63



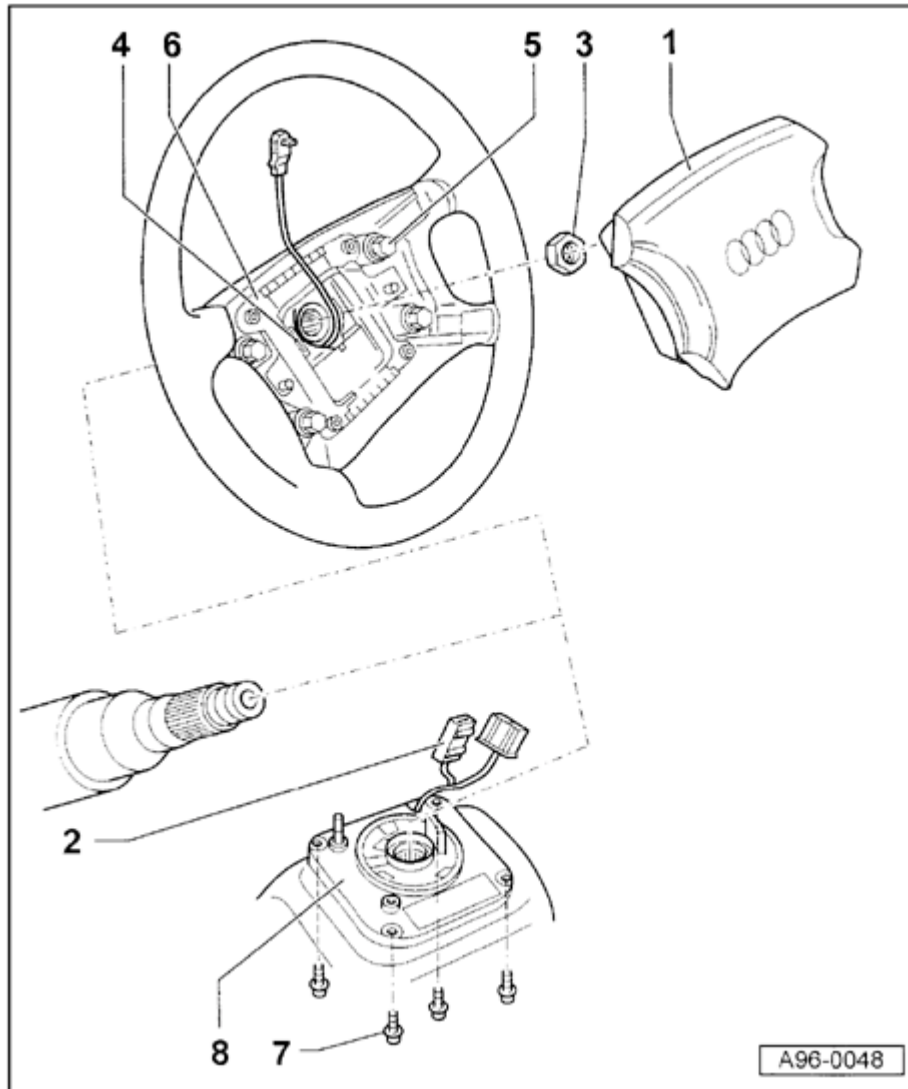
Sport steering wheel, removing and installing

Removing

- Remove airbag unit ⇒ page ⇒ [Page 69-61](#) .
- Center steering wheel (wheels straight).
- Remove bolt - 4 - .

Installing

- Center steering wheel (wheels straight).
- Replace bolt - 4 - and tighten to 60 Nm (44 ft lb).
- Install airbag unit ⇒ page ⇒ [Page 69-61](#) .



Spiral spring (➤ m.y. 1998), removing and installing

WARNING!

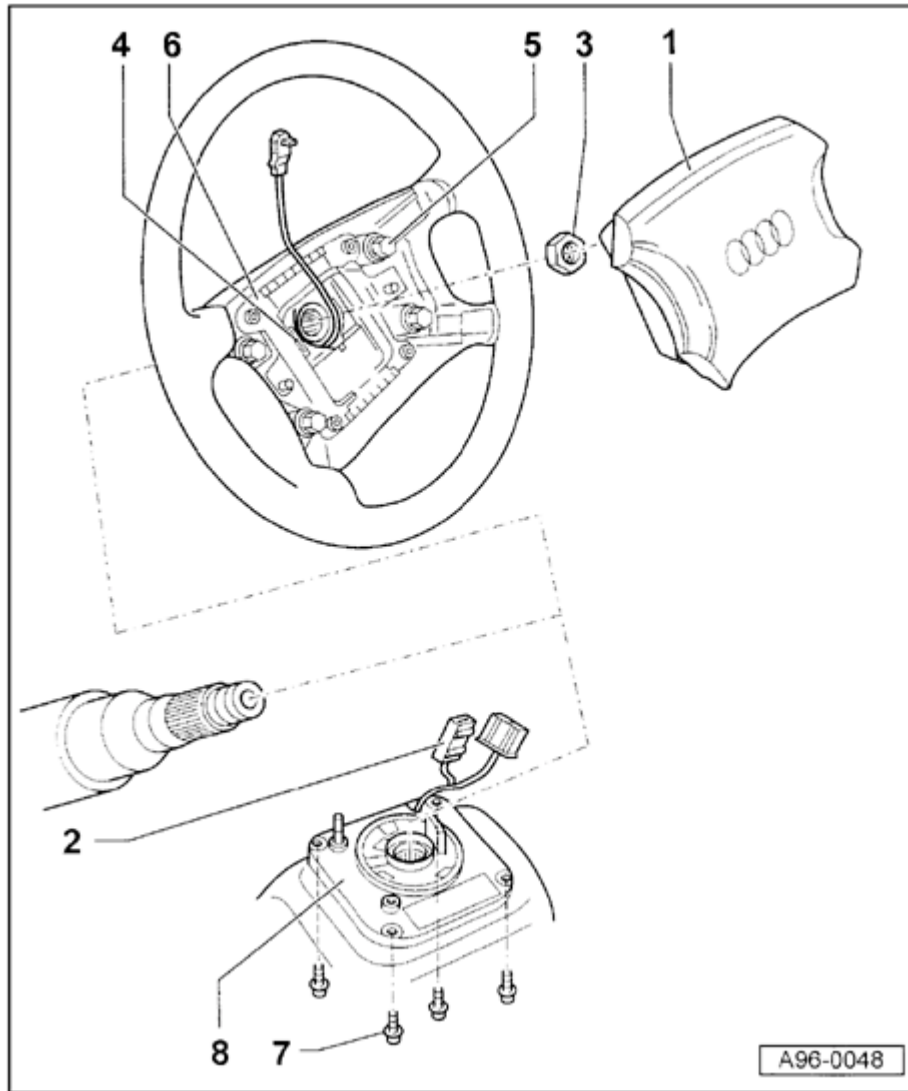
Follow all safety precautions when working on airbags ⇒ [page 69-40](#) .

- Disconnect battery Ground (GND) strap.
- Wheels must be facing straight ahead.
- Remove airbag unit ⇒ [page 69-53](#) .
- Remove steering wheel.

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 48](#)

- Remove bolts -5- (4x) from carrier unit -6-.

69-65



- Remove bolts -7- (4x) from spiral spring -8-.

WARNING!

Steering wheel and spiral spring can only be removed with the wheel straight-ahead. Do not rotate spiral spring after it is removed.

Notes:

- ◆ Even if spiral spring has been turned, determine center position.
- ◆ From the center position, the spiral spring should rotate approx. 3 1/2 revolutions in both directions.

1 - Airbag unit

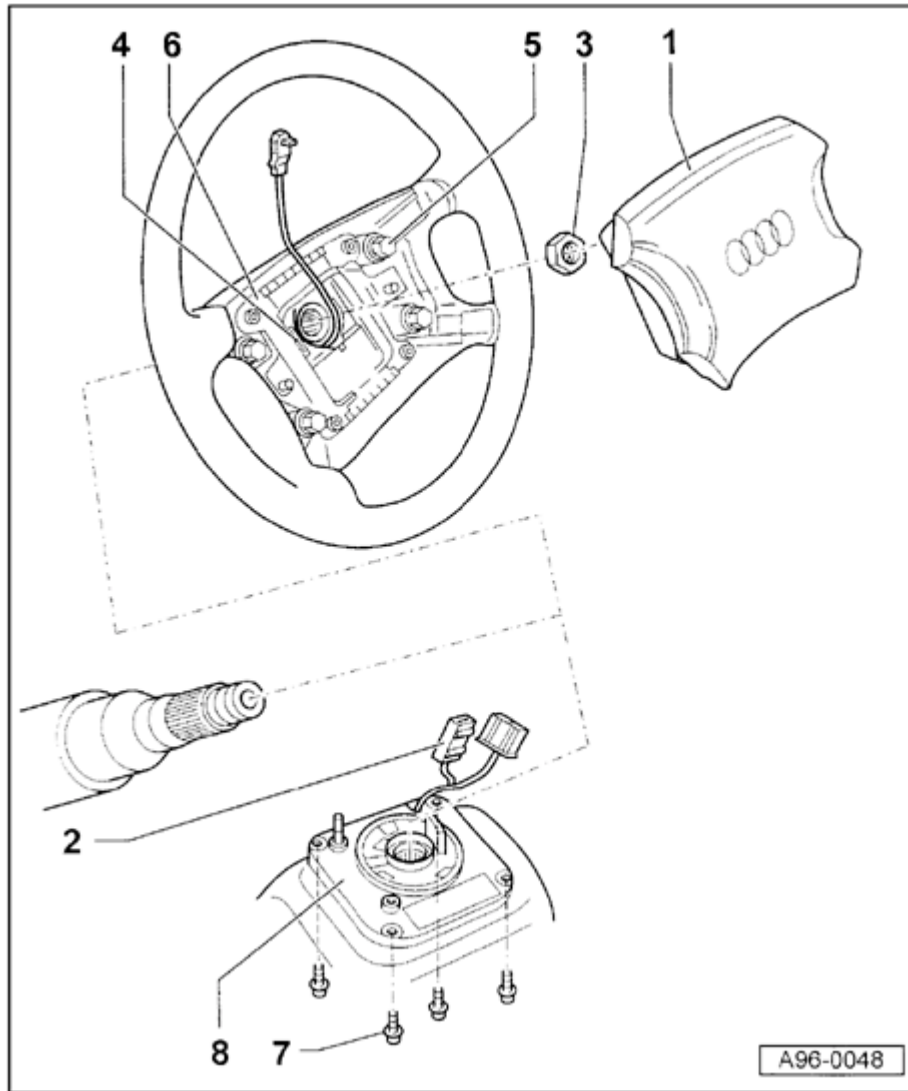
2 - Harness connector for airbag and horn

3 - Mounting bolt for steering wheel

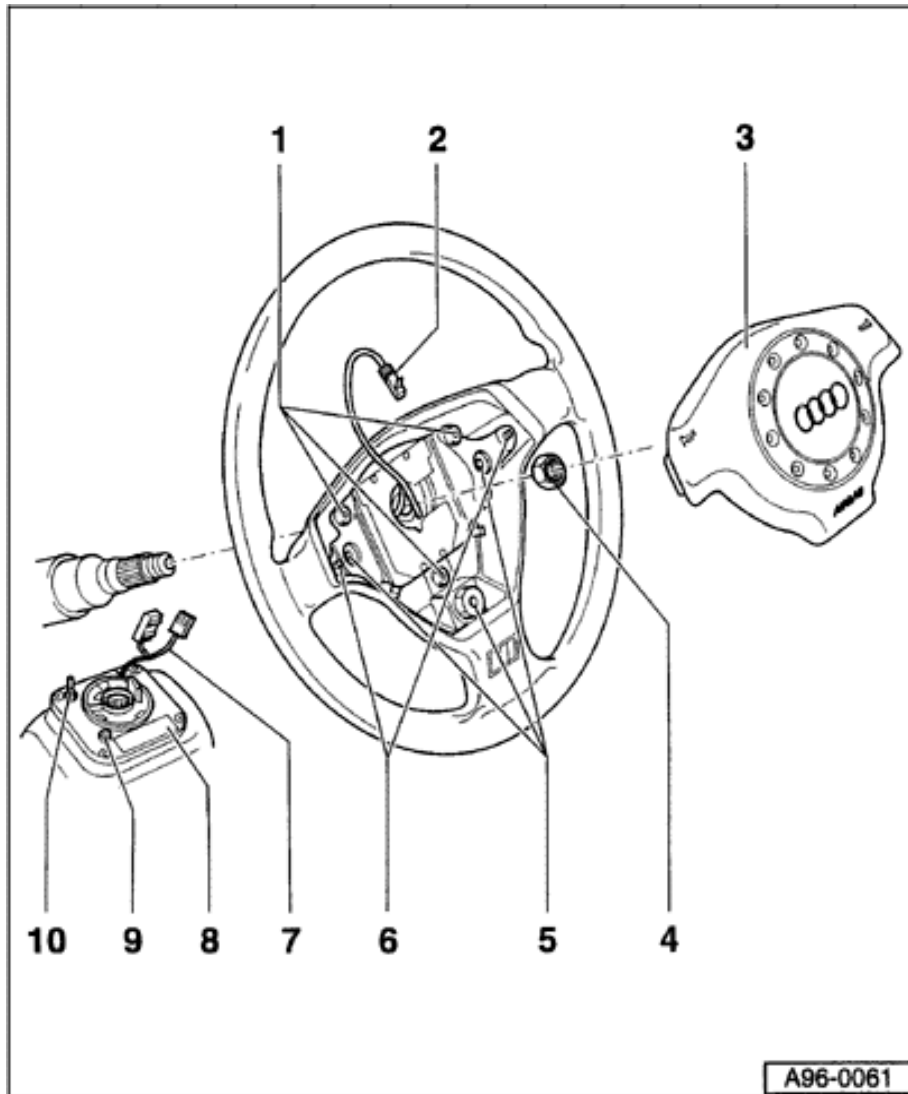
4 - Harness connector for horn

5 - Bolt (4x)

69-66

**6 - Carrier unit****7 - Bolt (4x)****8 - Spiral spring**

69-67



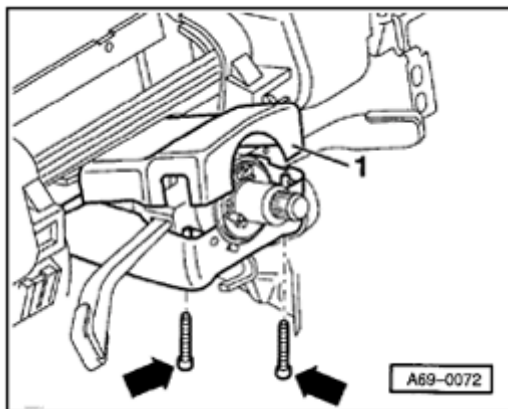
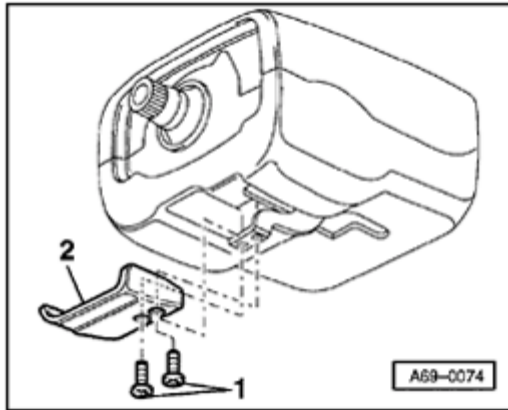
Sport steering wheel spiral spring (➤ m.y. 1998), removing and installing

Notes:

- ◆ *Wheels must be facing straight ahead.*
- ◆ *Before removing spiral spring, remove airbag unit and steering wheel.*
- Remove bolts -1- (3x).
- Tightening torque: 5 Nm (44 in. lb)
- Remove carrier unit. Disconnect harness connectors.
- Remove bolts -5- (3x).
- Tightening torque: 5 Nm (44 in. lb)
- Remove lower part of carrier unit. Disconnect harness connectors.
- Remove bolts securing spiral spring.
- Pull spiral spring downward and remove. Do not rotate spiral spring while it is removed.

Spiral spring, removing and installing

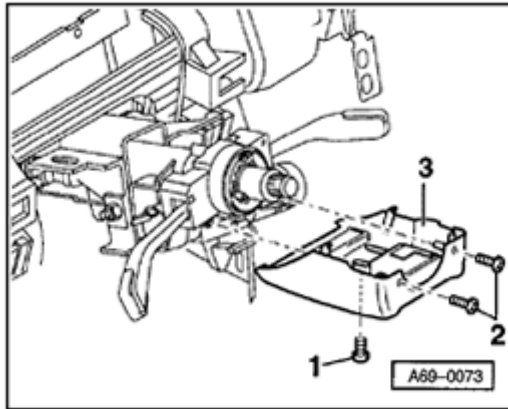
- Driver-side airbag unit and steering wheel removed
- Pull steering column all the way out and down.
- Remove bolt -1- (2x).
Tightening torque: 2.8 Nm (25 in. lb)
- Remove handle -2-.



- Remove two Phillips-head screws (arrows).
Tightening torque: 0.6 Nm (5 in. lb)
- Remove upper section of steering column switch -1-.

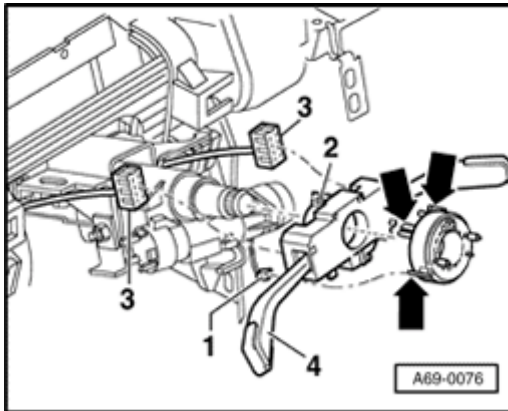
To install, insert upper shell into retaining tab in lower shell, swing down and install screws.

69-69



A

- Remove bolts -2- (2x).
Tightening torque: 0.6 Nm (5 in. lb)
- Remove hex bolt -1-.
Tightening torque: 0.6 Nm (5 in. lb)
- Remove lower trim for steering wheel switch -3-.

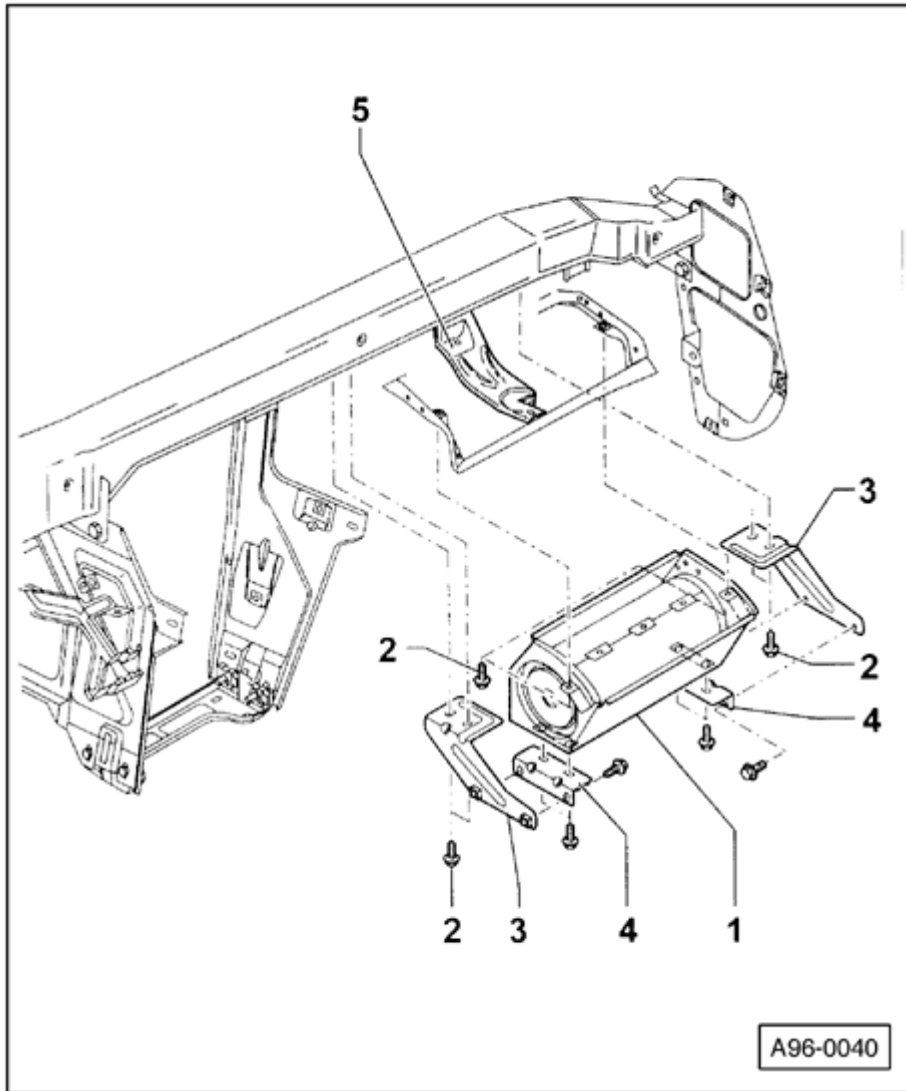


A

- Disconnect harness connector -1-.
- Release retaining tab (arrows) and pull spiral spring from steering wheel switch.

Notes:

- ◆ *Wheels must be in straight-ahead position when removing or installing spiral spring.*
- ◆ *A new spiral spring is secured in the centered position using a tie wrap.*



Passenger-side airbag unit, removing and installing

1 - Passenger-side airbag unit

WARNING!

Follow all safety precautions when working on airbags ⇒ [page 69-40](#) .

Removing:

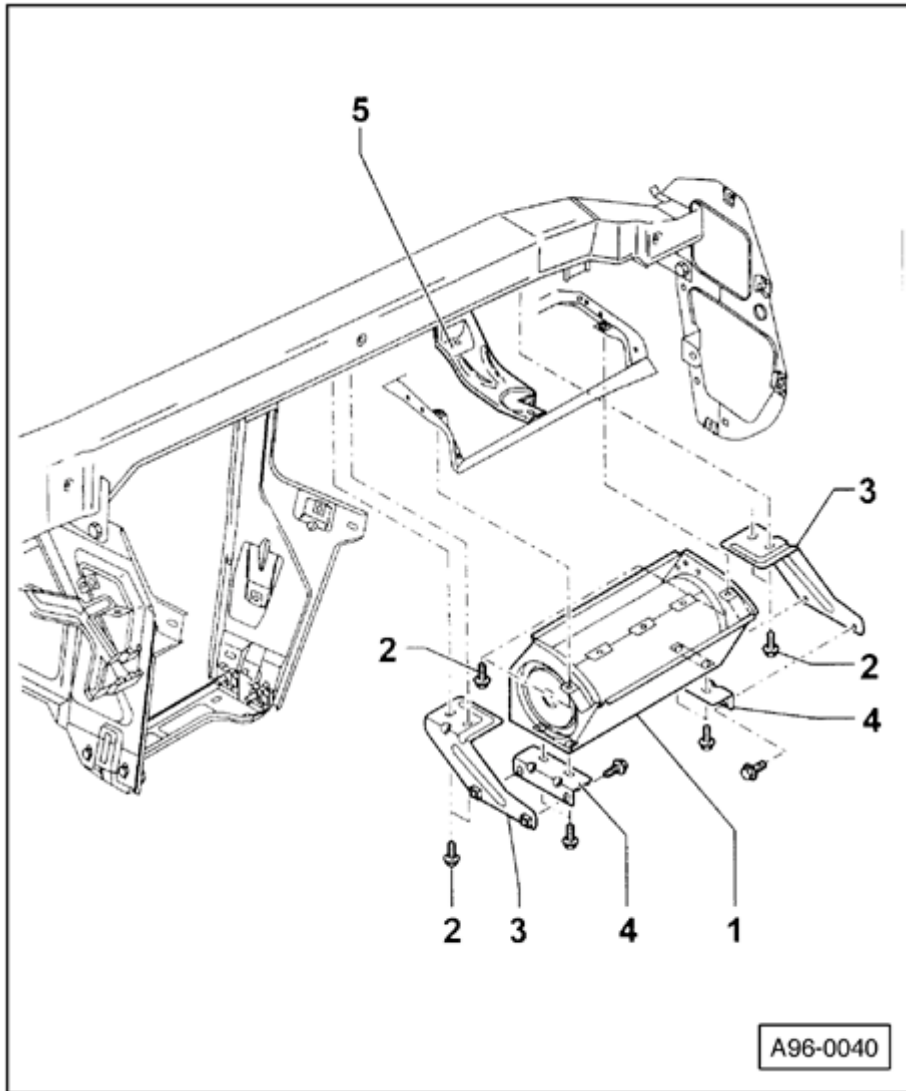
- Disconnect battery Ground (GND) strap.
- ◆ Remove passenger-side knee bolster ⇒ [page 68-1](#) .
- Disconnect harness connector (tunnel connection to rear and left of airbag unit) ⇒ [Fig. 1](#) .

WARNING!

Do NOT disconnect red 2-pin harness connector on side airbag unit under any circumstances.

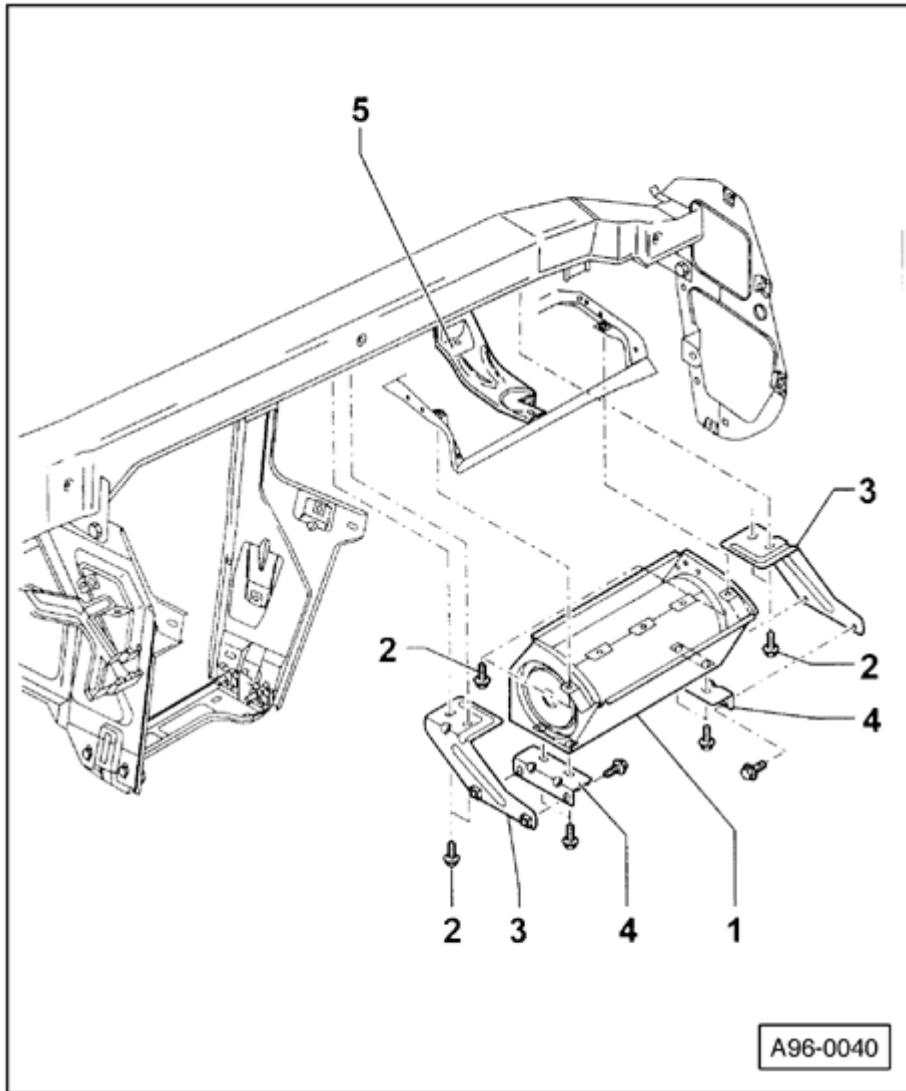
- First, disconnect both angle brackets -4-.
- Remove both angle brackets -3-.

69-71



- Remove bolts -2- at passenger-side airbag.
- Remove airbag unit.

69-72



- Place airbag unit on suitable surface with impact padding facing up.

Note:

Always replace instrument panel after passenger-side airbag has deployed.

Installing:

- Install airbag unit.
- Make sure harness connector -6- audibly engages (clicks).
- Switch ignition on.

WARNING!

Make sure no one is in vehicle.

- Connect battery Ground (GND) strap.

2 - Bolts (2x)

- ◆ Always replace after airbag has deployed
- ◆ 12 Nm (9 ft lb)

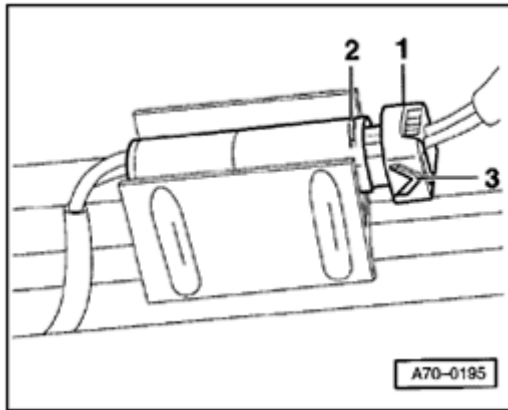
3 - Support

- ◆ Always replace after airbag has deployed

4 - Angle bracket

5 - Bracket

69-73



A

Fig. 1 Disconnecting airbag harness connector

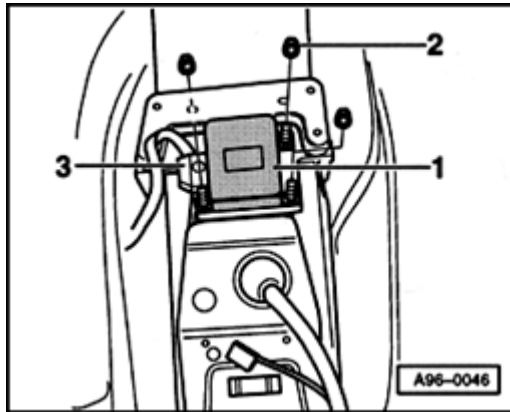
- Using screwdriver, push harness connector -1- for passenger-side airbag over retaining tab -2- and disconnect harness connector in direction of arrow -3-.

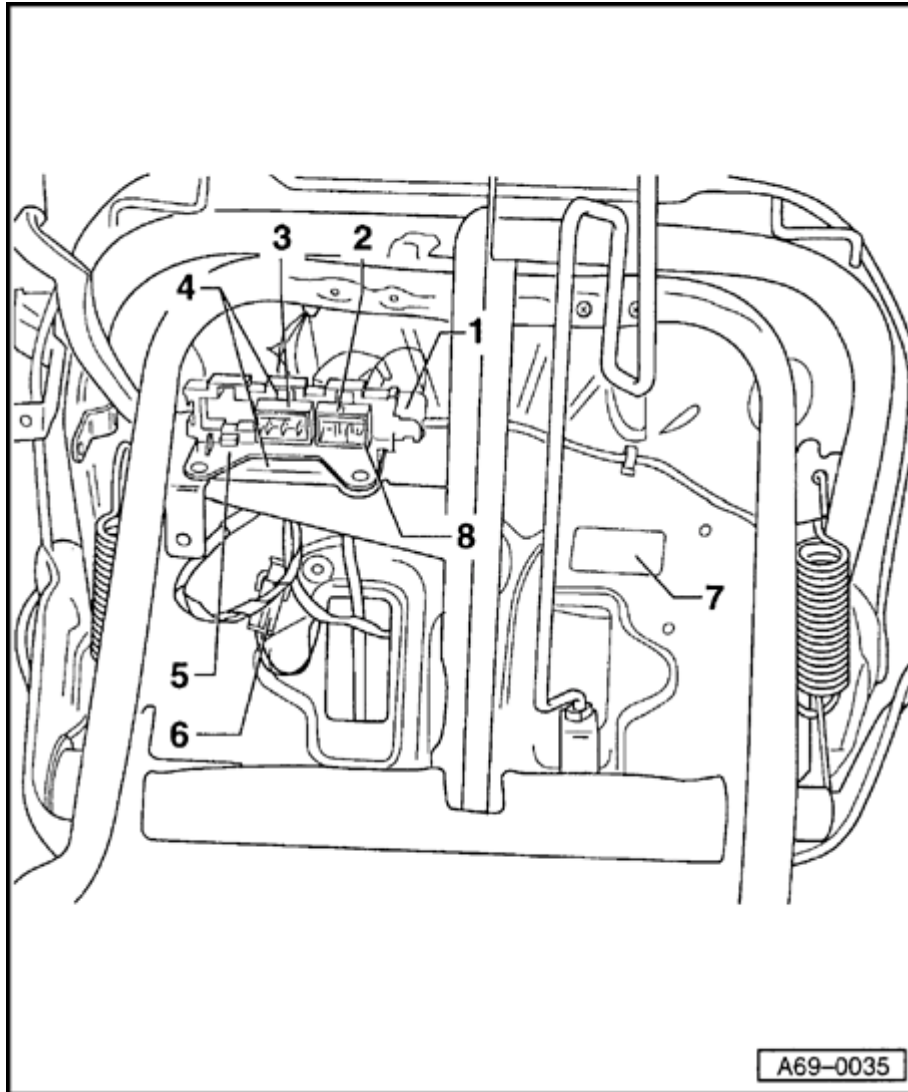
Airbag control module -J234-, removing and installing

- Disconnect battery Ground (GND) strap.
- Remove front center console ⇒ [page 68-30](#) .
- Disconnect securing bracket at harness connector -3-.
- Disconnect harness connector -3- from control module -1-.
- Remove nuts -2- (3x).
Tightening torque: 6 Nm (53 in. lb)
- Remove airbag control module -J234-.

Note:

If the airbag control module is replaced, the new control module must be coded.





Side airbag, removing and installing

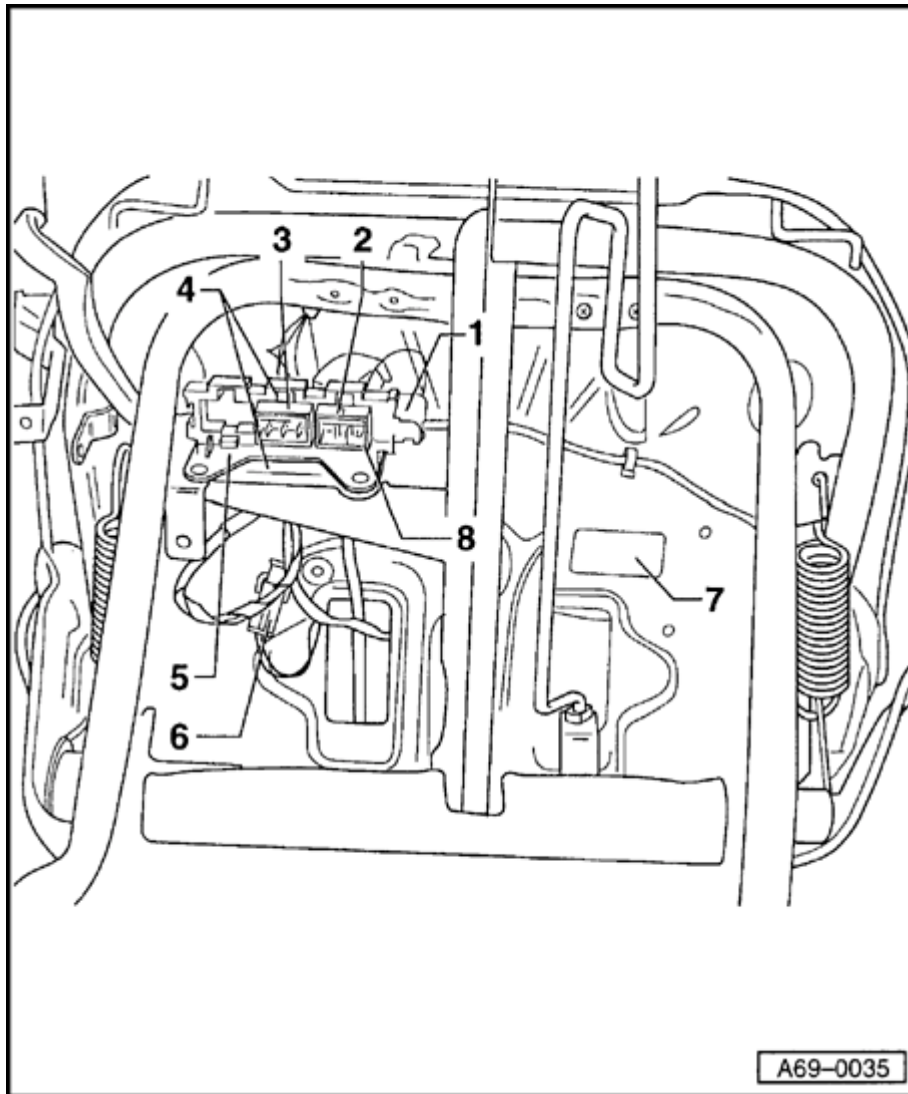
WARNING!

- ♦ **Follow all safety precautions when working on airbags** ⇒ [page 69-40](#) .
- ♦ **Before starting work on seats, connect VAS5094 airbag adapter** ⇒ [page 72-9](#) .

Removing

- Disconnect battery Ground (GND) strap.
- Remove seat ⇒ [page 72-2](#) .
- Remove outer trim pieces and trim on side of seat ⇒ [page 74-16](#) .
- Remove harness connector -2-.
- Disconnect Ground (GND) strap from harness connector -2-, chamber 4.
- Disconnect harness connector for side airbag -1- from connector strip -5- by pressing on retaining tab.

69-76



- Disconnect intermediate connector for seatback heater -6-.
- Disconnect harness connector for side airbag -1- from outer edge of seat ⇒ [Fig. 1](#)
- Remove side airbag unit ⇒ [page 69-79](#) .

1 - Harness connector for side airbag

2 - Harness connector for sensor mat

3 - Retaining tab

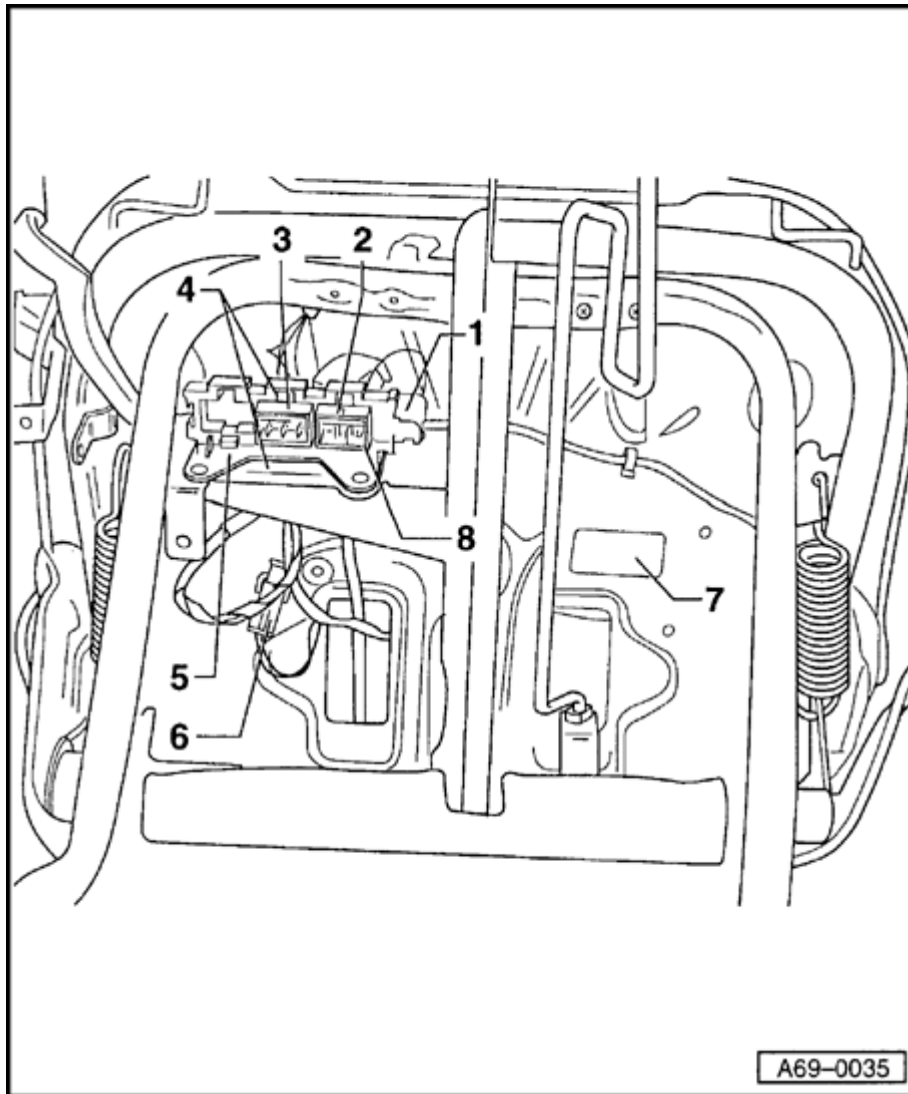
4 - Harness connector for seat heater

5 - Connector strip

6 - Intermediate connector for seatback heater

7 - Airbag number sticker

69-77



8 - Bar in connector

Installing:

WARNING!

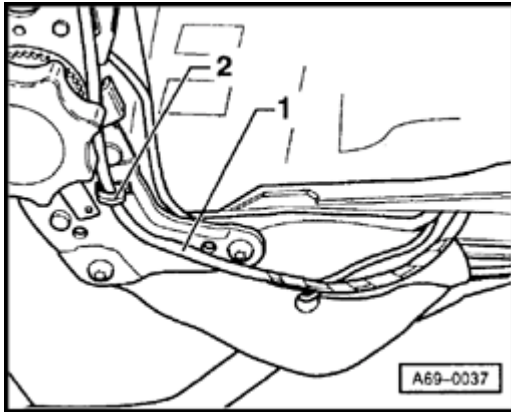
- ♦ *To ensure that the side airbag functions properly, when working on backrest cover, always install new upholstery clips in the same locations they were removed from.*
- ♦ *Only use seat covers approved for use with side airbags.*

- Install harness connector -2- at same location as when removed and ensure that bar -8- points toward tunnel.
- Switch ignition on.
- Close doors.

WARNING!

Make sure no one is in vehicle.

- Connect battery Ground (GND) strap.



A

Fig. 1 Wiring location on outer edge of seat

- Remove backrest cover ⇒ [page 74-12](#) .
- Unclip clip -2- (1x).

WARNING!

When installing side airbag cable -1-, make sure that it doesn't rub against any moving parts.

Side airbag unit, removing and installing

WARNING!

Before starting work on seats, connect VAS5094 airbag adapter ⇒ [page 72-9](#) .

Removing

A

- Remove bolts -2- (2x).

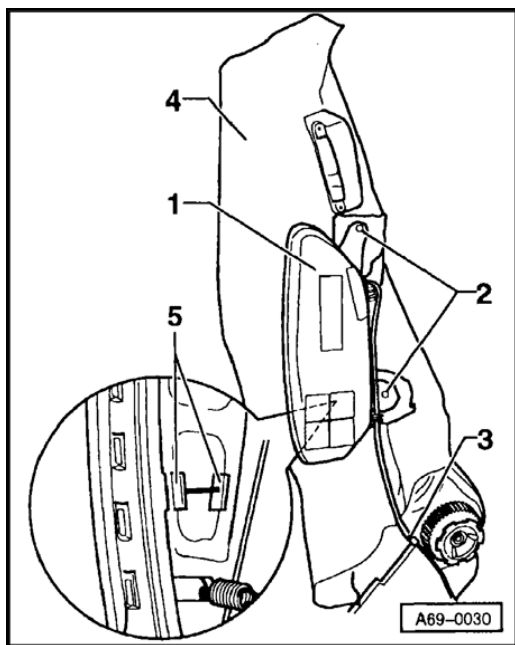
WARNING!

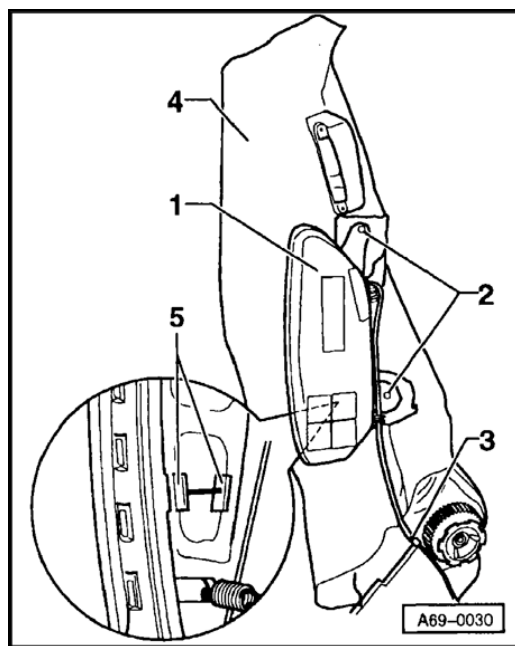
- ♦ **Do NOT reuse bolts -2-. Replace the metal bolts with M5 bolts and nuts supplied.**
- ♦ **Drill mounting holes to 5.5 mm.**
- ♦ **Tightening torque: 5.5 Nm (49 in. lb)**

Note:

Illustration is shown without anti-crush fleece.

- Carefully disconnect side airbag -1- at retaining clip -5-.
- Remove side airbag -1-.
- Place airbag unit on appropriate surface with impact padding facing up.



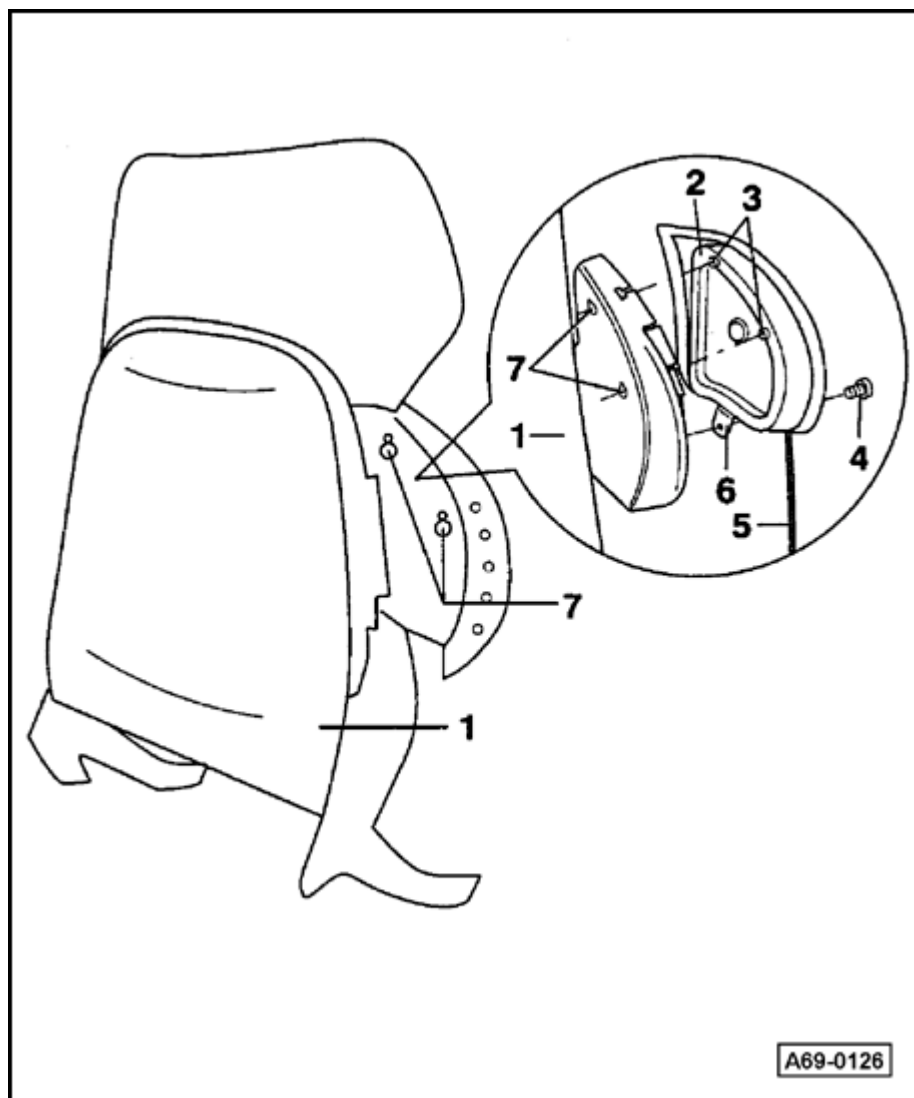


Installing

Note:

Do not cut anti-crush fleece -4- in area near retaining clip -5-.

- Remove anti-crush fleece -4- before drilling.
- Drill out mounting holes to 5.5 mm.
- Pull anti-crush fleece -4- over seat backrest frame.
- Clip side airbag -1- with anti-crush fleece into place.
- Install bolts -2-, pull up anti-crush fleece -4-, install nuts and tighten to 5.5 Nm (49 ft lb).
- Remove expiration date sticker from airbag unit and place over old sticker on driver's door.
- If vehicle does not have label, note airbag replacement in maintenance plan.
- Remove airbag number sticker from airbag unit and place over old sticker on seat pan ⇒ [page 69-75](#) , item -7-.



Side airbag for Recaro seat, removing and installing

WARNING!

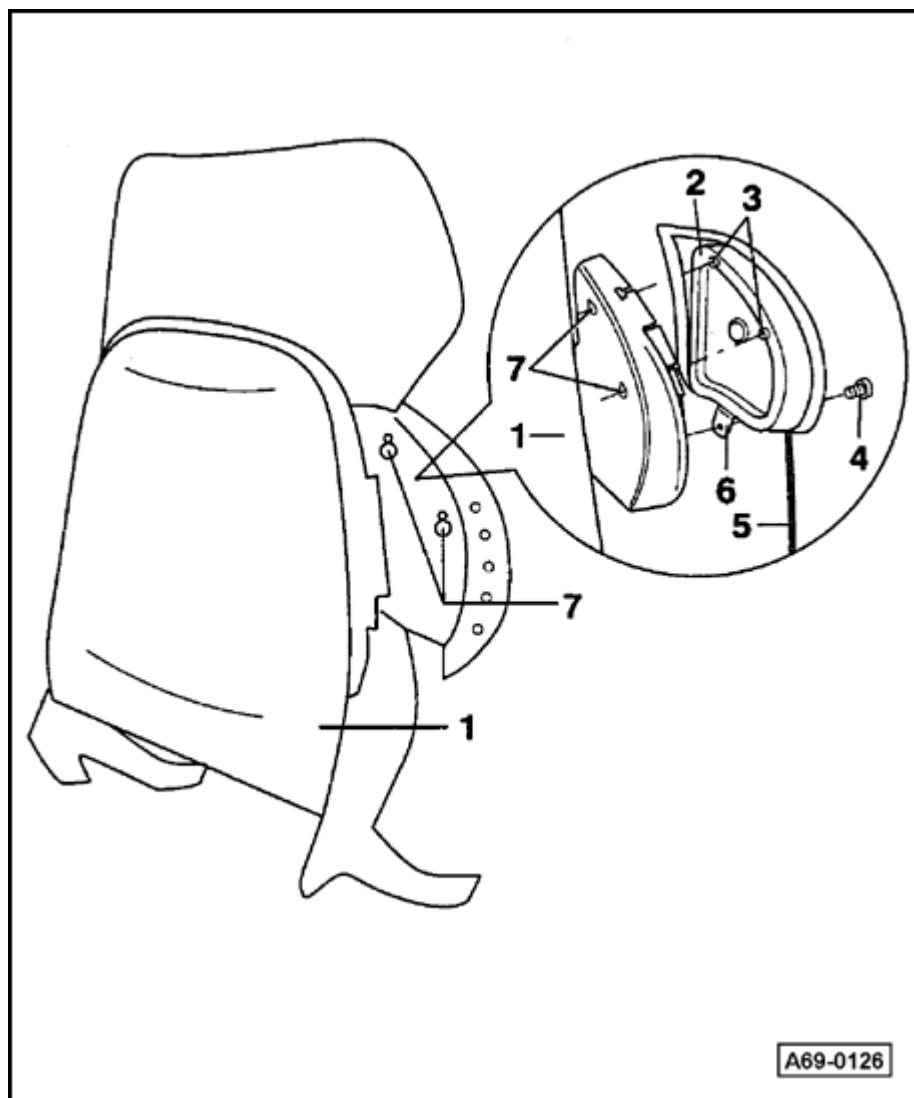
- ♦ **Follow all safety precautions when working on side airbag.**
- ♦ **Before starting work on seats, connect VAS5094 airbag adapter ⇒ [page 72-9](#).**

1 - Backrest

2 - Side airbag unit

Removing:

- Remove Recaro seat ⇒ [page 72-25](#).
- Remove mounting trim ⇒ [page 72-41](#).
- Disconnect yellow airbag harness connector under seat.
- Disconnect black Ground (GND) harness connector for airbag, located under seat.
- Unbolt bolt -4- on retainer -6- on underside of side airbag unit -2-.
- Push side airbag unit -2- downward.
- Carefully pull out side airbag unit -2-.



Installing:

WARNING!

Make sure vehicle is not occupied.

Note:

Always replace bolt -4-.

- Install side airbag unit -2- so that engaging pins -3- engage in locating holes -7-.
- Push side airbag unit up to stop.
- Tighten new bolt -4- on side airbag unit to 10 Nm (7 ft lb).
- Install airbag cable -5-.
- Connect yellow harness connector of airbag cable and black harness connector for airbag Ground (GND) strap underneath seat.
- Reinstall mounting trim.

3 - Engaging pins

4 - Bolt

◆ 10 Nm (7 ft lb)

5 - Airbag cable

6 - Retainer

7 - Locating holes

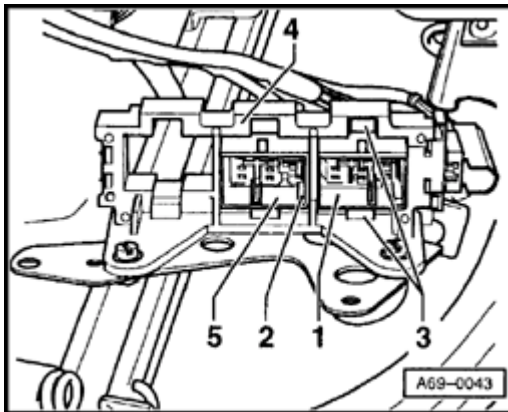
Seat occupant sensor, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

Note:

The seat occupant sensor will be used at a later time.



A

- Removing seat ⇒ [page 72-2](#) .
- Remove seat cover ⇒ [page 74-15](#) .

Note:

Sensor mat is only available as a replacement part which includes seat heater and seat cushion.

- Press retaining tabs -3- and disconnect connector -1- for seat occupant sensor from connector strip -4-.
- Disconnect Ground (GND) strap from harness connector -1- (location -4-).
- Unclip harness connector -5- and disconnect intermediate connector to backrest.
- Remove seat cushion along with sensor mat and seat heater from seat pan.

- When installing, make sure bar -2- points toward tunnel.
- After installing sensor mat, test sensor mat function using VAG1551 Scan Tool (ST) ⇒ [page 69-84](#) .

Testing sensor mat function

Note:

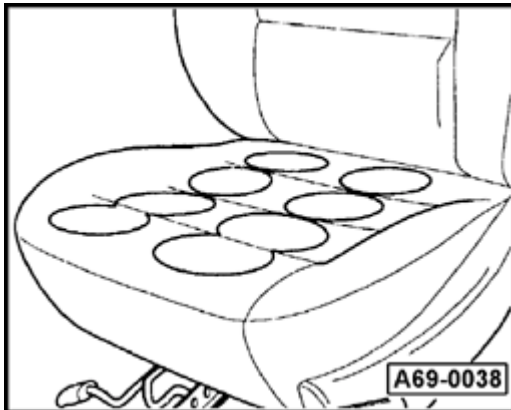
Illustration is shown without cover.

- Remove any seat mats before testing sensor mats.
- - Connect VAG1551 scan tool
⇒ [Repair Manual, Body On Board Diagnostic \(OBD\), Repair Group 01](#) .
 - Select Read Measuring Value Block (function

08) and
input
display
group
number
003

⇒ [Repair Manual, Body
On Board Diagnostic
\(OBD\), Repair Group
01](#) .

Read Measuring Value Block number 2 for seat
occupant sensor passenger side indicates: not
occupied.



A

- Test each sensor group by pressing on them with your hand until display changes from "not occupied" to "occupied" (max. load 12 kg).

Note:

If "occupied" is indicated, even though you are not pressing sensor group, either the sensor mat is malfunctioning or the seat cover is too tight.

Crash sensor for side airbag, removing and installing

WARNING!

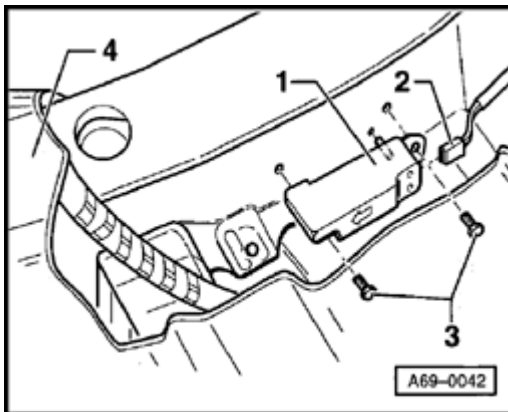
Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

Notes:

- ◆ *A crash sensor for the side airbag is located under both the driver's and passenger's seats.*
- ◆ *Both crash sensors for the side airbags are identical.*
- ◆ *When installed, the arrow points down.*

Removing

- Disconnect battery Ground (GND) strap.
- Remove front seat ⇒ [page 72-2](#) .
- Remove lower A-pillar trim ⇒ [page 70-72](#) .
- Unclip sill molding and fold upward.
- Pull up floor mat -4- near sensor.
- Disconnect harness connector -2- from crash sensor for side airbag -1-.
- Remove bolts -3- (2x).
Tightening torque: 6 Nm (53 in. lb)
- Remove crash sensor for side airbag -1-.



Installing

- Switch ignition on.
- Close doors.

WARNING!

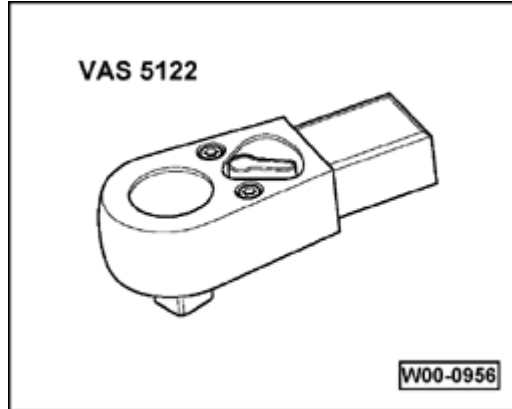
Make sure no one is in vehicle.

- Connect battery Ground (GND) strap.

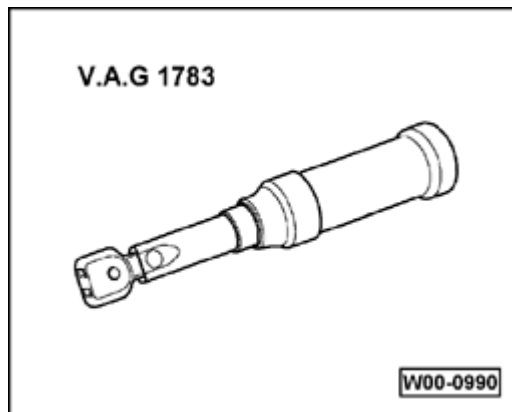
69-87

Side curtain protection airbag, servicing

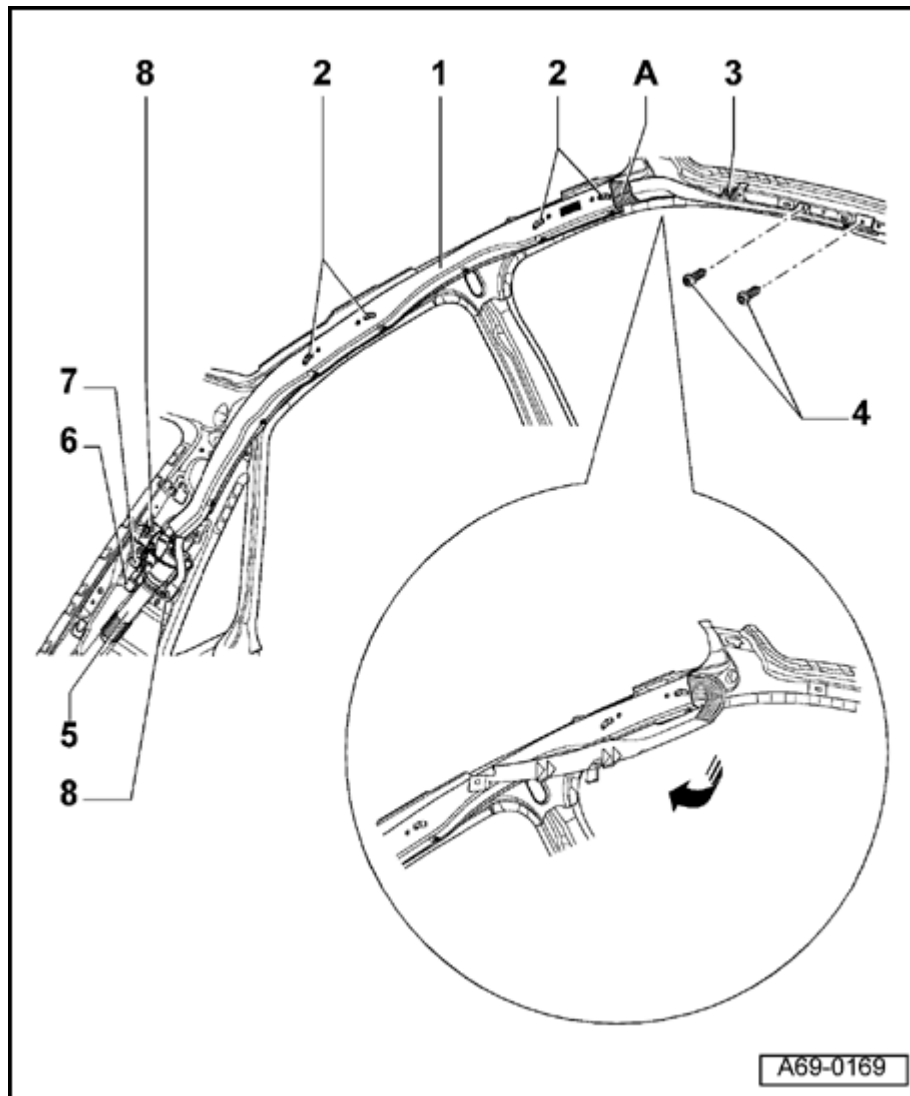
Special tools and equipment



◆ VAS 5122



◆ VAG 1783



Side curtain protection airbag (sedan), removing and installing

WARNING!

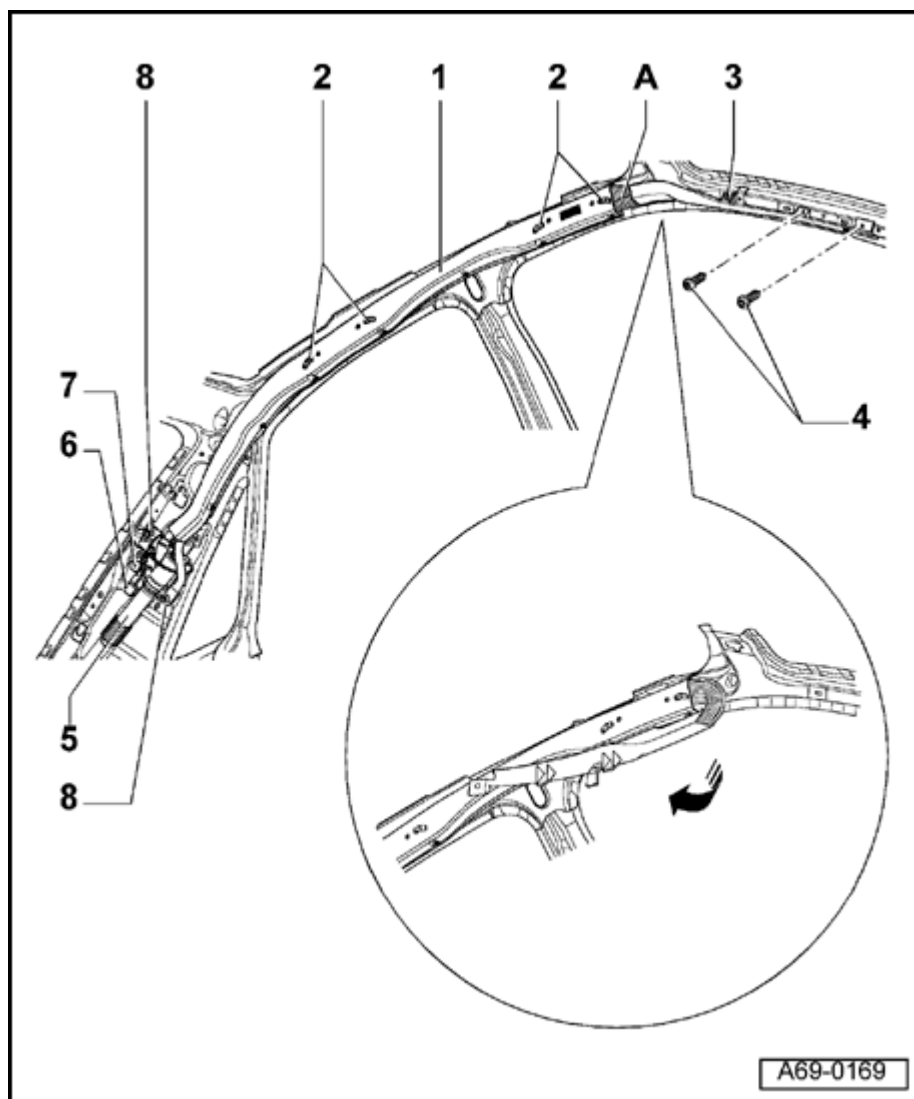
Follow all safety precautions when working on airbags ⇒ [page 69-40](#) and **side curtain airbag** ⇒ [page 69-49](#) .

1 - Side curtain airbag

Removing:

- Remove upper A-pillar trim panel ⇒ [page 70-88](#) .
- Remove upper B-pillar trim without loosening seat belt ⇒ [page 70-91](#) .
- Remove upper D-pillar trim ⇒ [page 70-96](#) .
- Remove bolts - 4 - (2x).
- Unclip side curtain airbag at clip - 3 -.
- Fold front portion of side curtain airbag toward rear and secure at Velcro[®] strip (inset).
- Disconnect harness connector for side curtain airbag ⇒ [Fig. 2](#) .
- Remove bolts - 8 - (2x).
- Remove igniter - 5 - at clip - 7 -.

69-89



- Remove side curtain airbag - 1 - by grab handle adapters - 2 -.

WARNING!

Always follow installation sequence for side curtain airbag.

Installing:

- Secure side curtain airbag at grab handle adapters - 2 - (2x) using pre-assembly clips ⇒ [Fig. 5](#)
- Clip igniter - 5 - in at clip - 7 -.
- Install bolts - 8 - (2x) ⇒ [Fig. 1](#) .
- Release front portion of airbag - 1 - and fold it back to A-pillar, during this, twist-securing seam -A- must face center of vehicle.
- Clip in side curtain airbag using clip - 3 -.
- Install bolt - 4 - ⇒ [Fig. 3](#) .
- Remainder of installation is in reverse order of removal
- Switch ignition on.

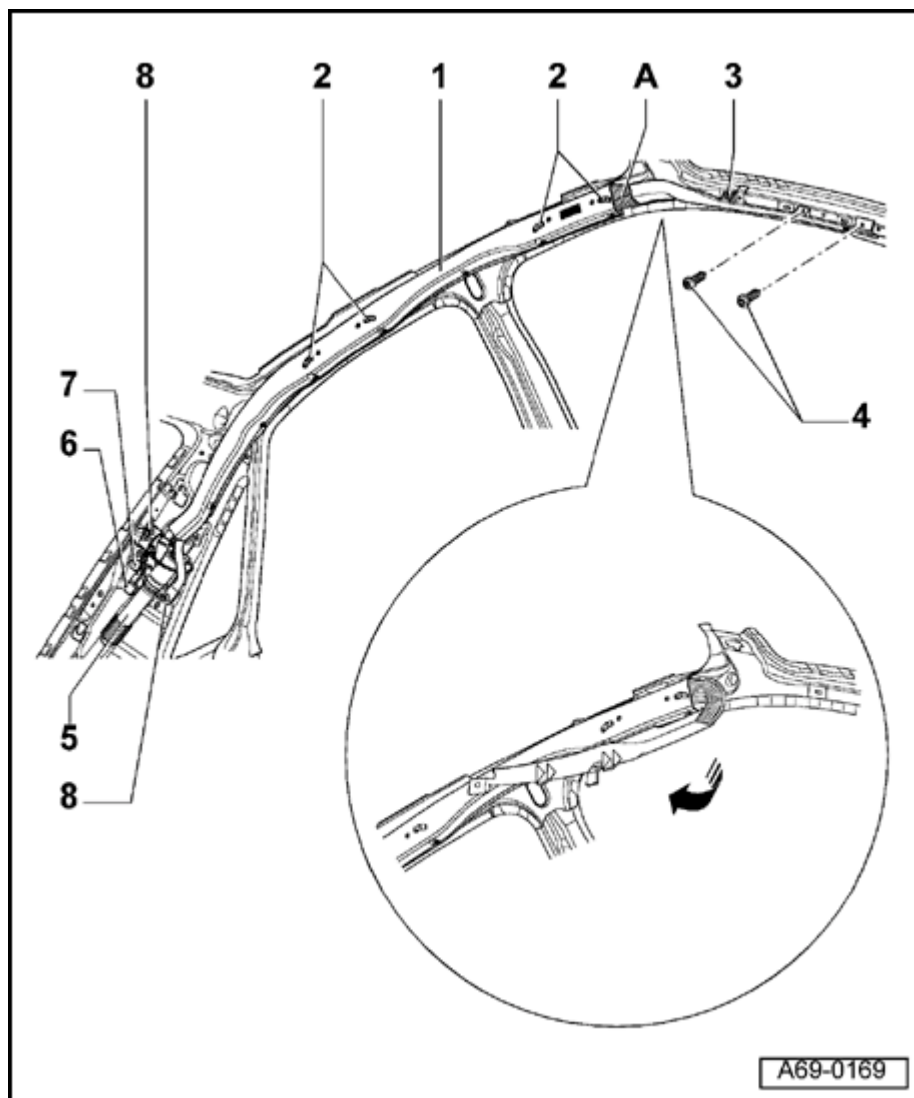
WARNING!

Make sure the passenger compartment is not

occupied before connecting the battery Ground (GND) strap.

- Connect battery.

69-90

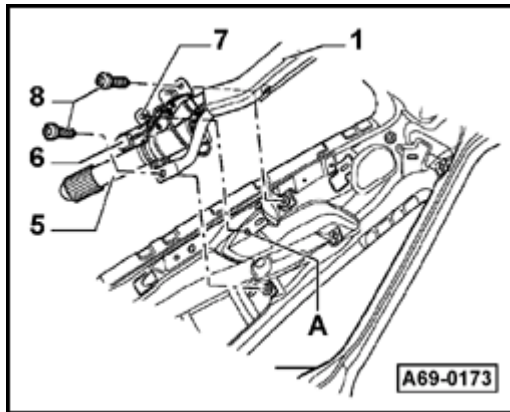
**2 - Grip handle adapter****3 - Clip****4 - Bolts (2x)**

- ◆ 4 Nm (35 in. lb)
- ◆ Self-locking
- ◆ Always replace
- ◆ Always clean threaded holes for drive flange bolts (e.g. using tap)

5 - Igniter**6 - Side curtain airbag harness connector****7 - Clip****8 - Bolts (2x)**

- ◆ 4 Nm (35 in. lb)
- ◆ Self-locking
- ◆ Always replace
- ◆ Always clean threaded holes for drive flange bolts (e.g. using tap)
- ◆ Use VAS5 122 and VAG 1783

69-91



A

Fig. 1 Igniter at D-pillar

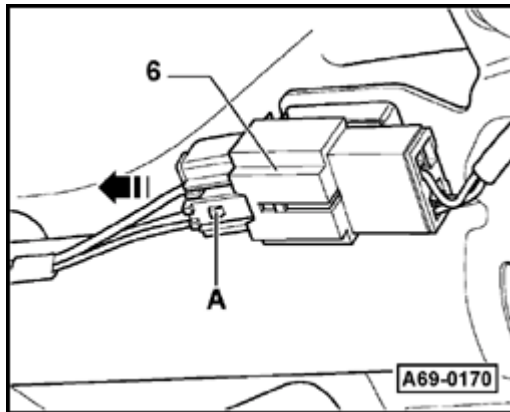
- Engage clip -7- in mount -A-.
- Install bolts -8-.
- ◆ Tightening torque: 4 Nm (35 in. lb)
- ◆ Use VAS 5122 and VAG 1783

1 - Side curtain airbag

5 - Igniter

6 - Airbag connector

7 - Clip



A

Fig. 2 Disconnecting harness connector for side curtain airbag

- Press catches -A- and disconnect harness connector in direction of arrow.

6 - Side curtain airbag harness connector

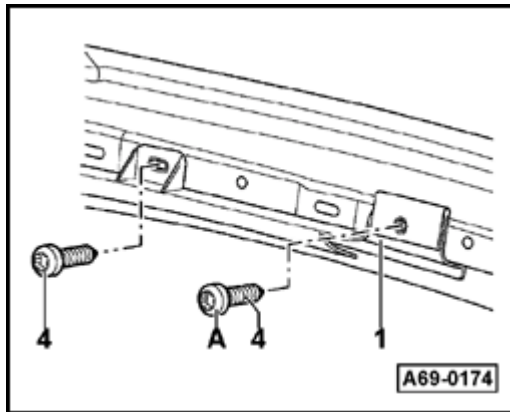


Fig. 3 Side curtain airbag at lower A-pillar

- Install lower bolt -A- first.

1 - Side curtain airbag

4 - Bolts (2x)

Tightening torque: 4 Nm (35 in. lb)

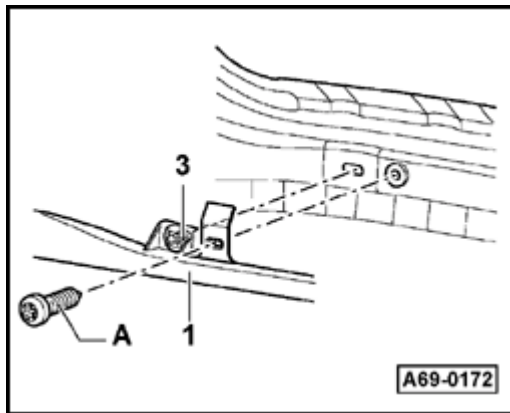


Fig. 4 Side curtain airbag at upper A-pillar

- Engage clip -3-.

- Bolt -A- must be attached along with A-pillar trim panel.

1 - Side curtain airbag

3 - Clip

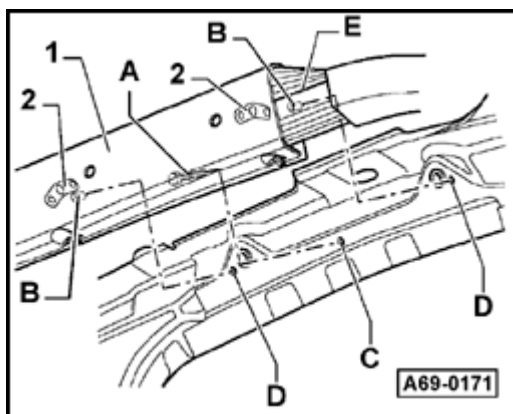


Fig. 5 Mounting side curtain airbag at roof grab handle

The procedure is the same at the front and the rear.

- Insert pre-assembly clip -A- into mounting point -C-.
- Insert pins -B- in mounting points -D-.
- Twist-securing seam -E- must face center of vehicle.

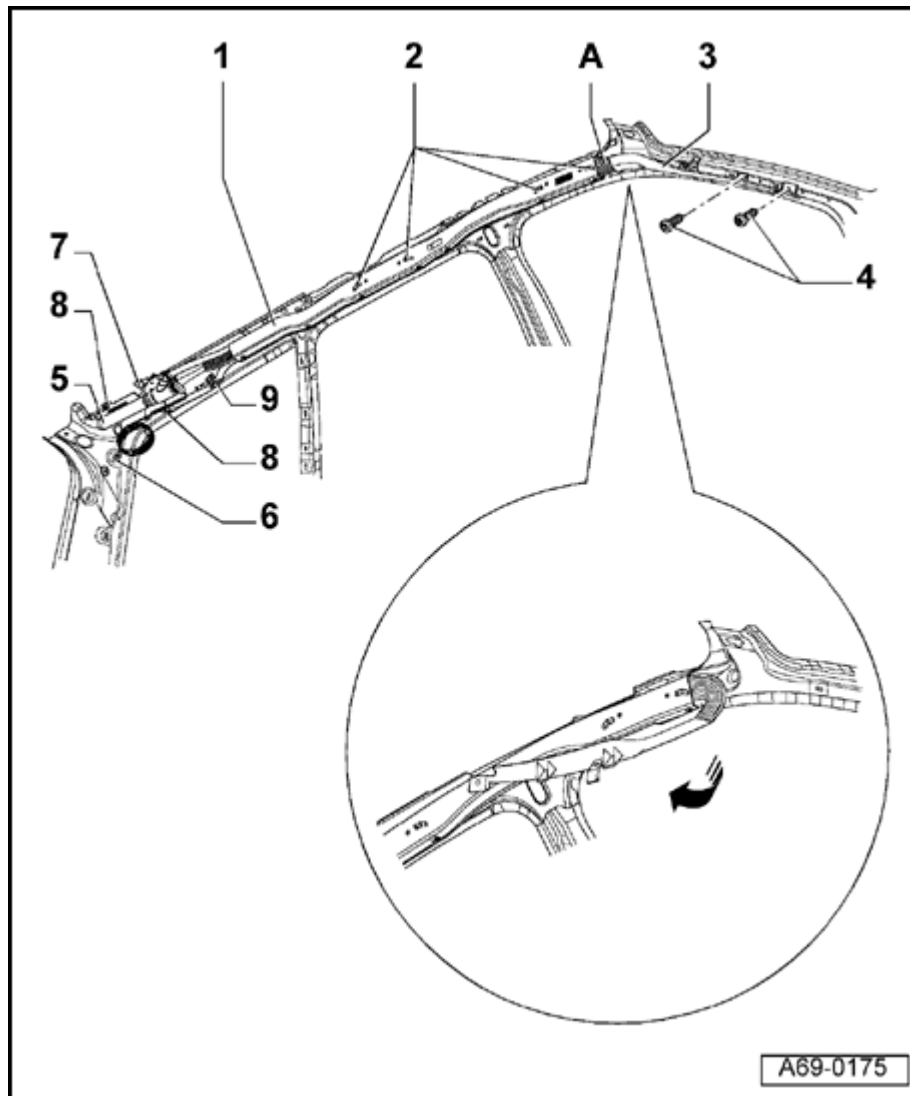
1 - Side curtain airbag

2 - Grip handle adapter, delivery casing airbag

Notes:

- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, window regulators) according to the repair manual and/or Owner's Manual.*
- ◆ *If the airbag Malfunction Indicator Lamp (MIL) -K75- indicates a malfunction, the DTC memory must be erased and then checked again using the VAG1551 scan tool.*

⇒ [Repair Manual, Body On Board Diagnostic \(OBD\), Repair Group 01](#)



Side curtain protection airbag (Avant), removing and installing

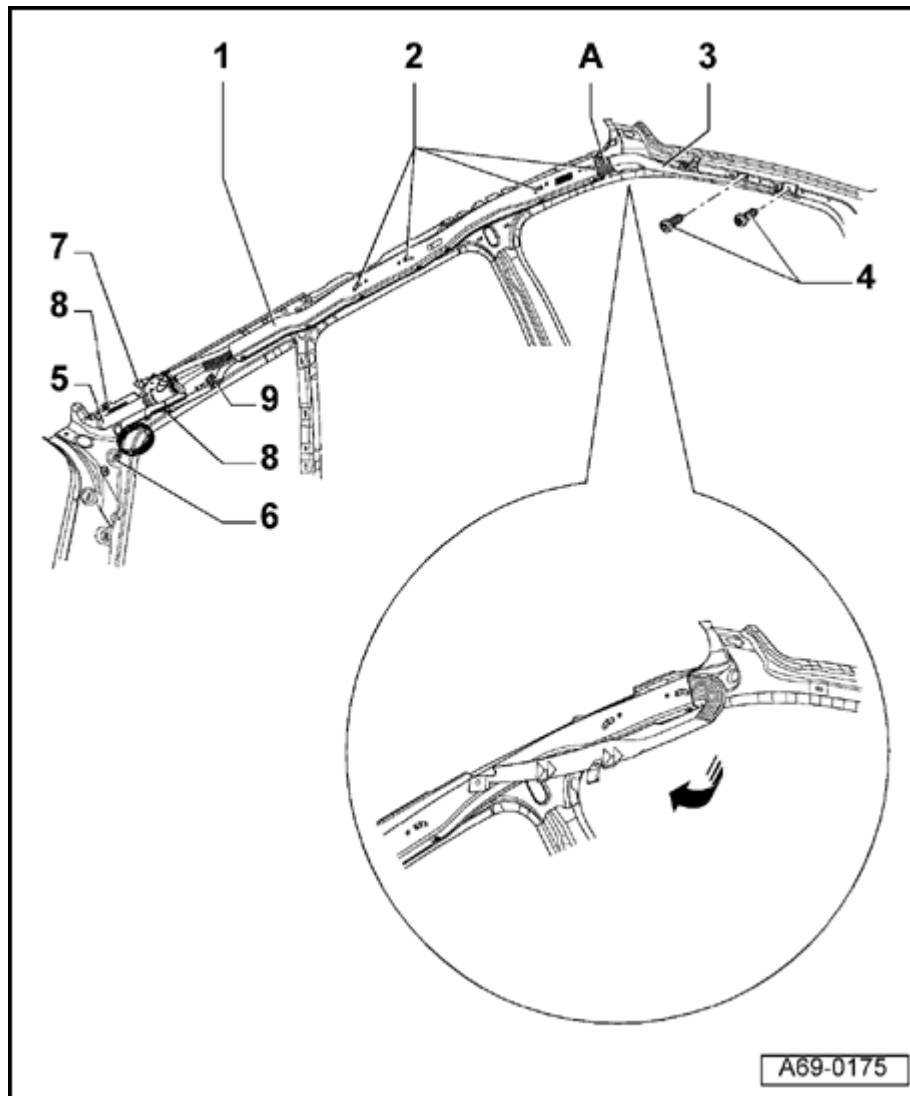
WARNING!

Follow safety precautions for working on airbags ⇒ [page 69-40](#) **and side curtain airbag** ⇒ [page 69-49](#) .

1 - Side curtain airbag

Removing:

- Remove upper A-pillar trim panel ⇒ [page 70-88](#) .
- Remove upper B-pillar trim without loosening seat belt ⇒ [page 70-91](#) .
- Remove upper C-pillar trim ⇒ [page 70-106](#) .
- Remove upper D-pillar trim ⇒ [page 70-107](#) .
- Remove bolts - 4 - (2x).
- Unclip side curtain airbag at clip - 3 -.



- Fold front portion of side curtain airbag toward rear and secure at Velcro[®] strip (inset).

WARNING!

NEVER disconnect the yellow 2-pin harness connector on the side curtain airbag!

- Disconnect harness connector for side curtain airbag behind side trim panel ⇒ [Fig. 2](#) .
- Remove cable from D-pillar.
- Remove bolts - 8 - (2x).
- Remove igniter - 5 - at clip - 9 -.
- Disengage retaining tab - 7 -.
- Remove side curtain airbag - 1 - by grab handles - 2 -.

WARNING!

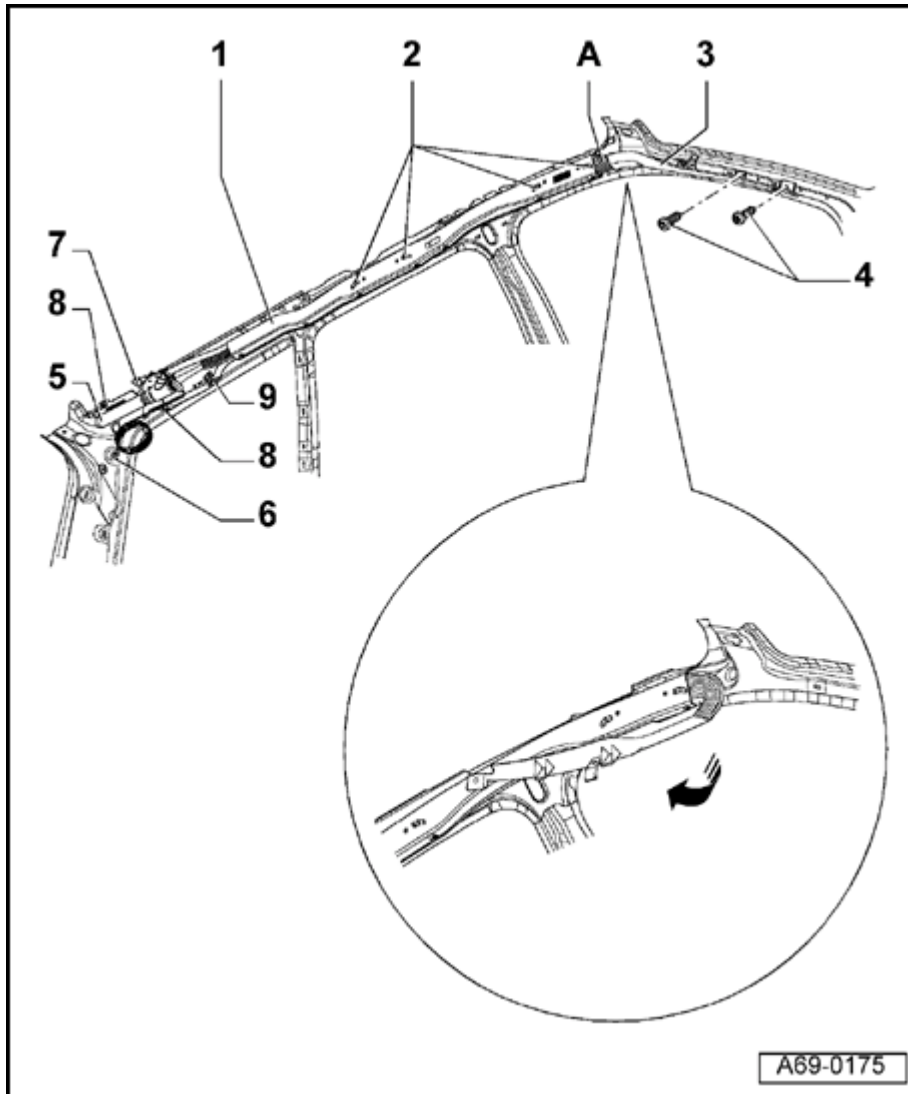
Always follow installation sequence for side curtain airbag.

Installing:

- Secure side curtain airbag at grab handle adapters - 2 - (2x) using pre-assembly clips ⇒ [Fig. 5](#) .

- Install bolts - 8 - (2x) ⇒ [Fig. 1](#) .

69-96



- Release front portion of airbag - 1 - and fold it back to A-pillar, during this, twist-securing seam -A- must face center of vehicle.
- Clip in side curtain airbag using clip - 3 - ⇒ [Fig. 4](#) .
- Install bolt -4- ⇒ [Fig. 3](#) .
- Remainder of installation is in reverse order of removal
- Switch ignition on.

WARNING!

Make sure the passenger compartment is not occupied before connecting the battery Ground (GND) strap.

- Connect battery.

2 - Grip handle adapter

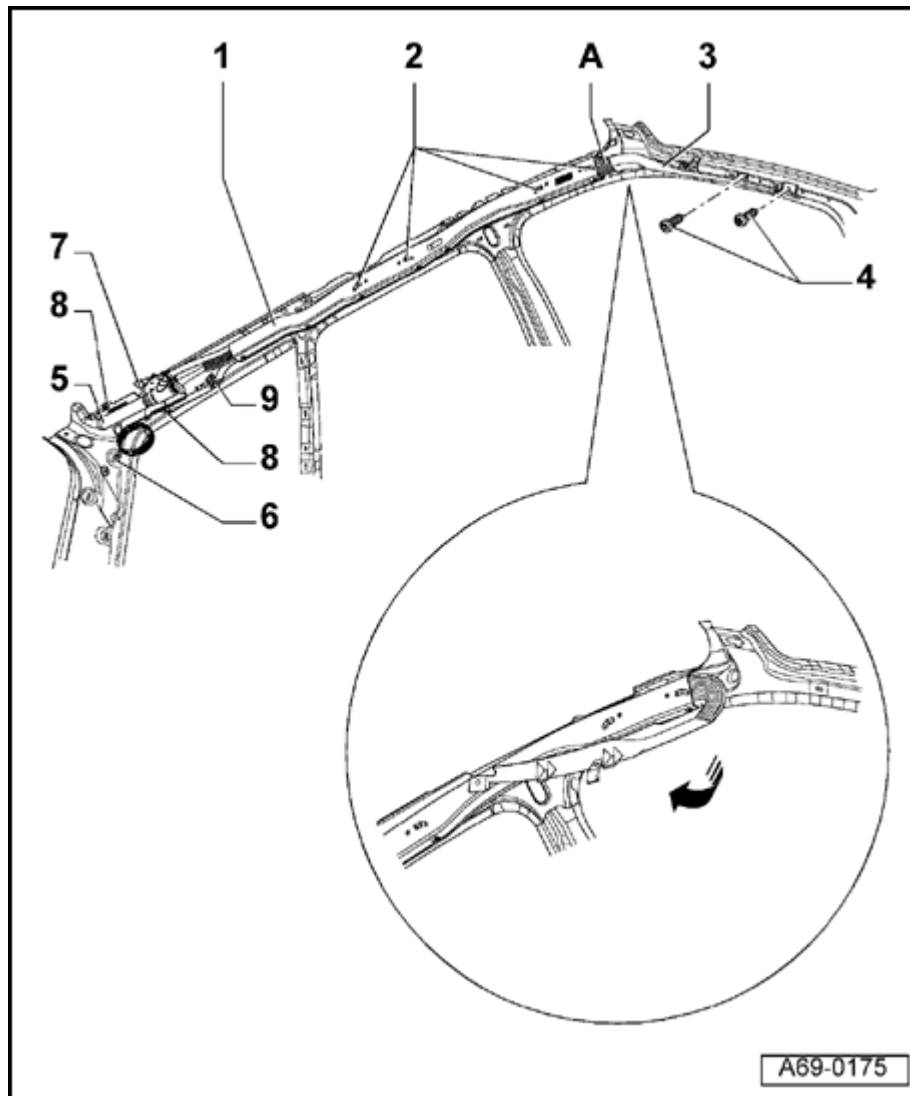
3 - Clip

4 - Bolts (2x)

- ◆ 4 Nm (35 in. lb)
- ◆ Self-locking
- ◆ Always replace
- ◆ Always clean threaded holes for drive

flange bolts (e.g. using tap)

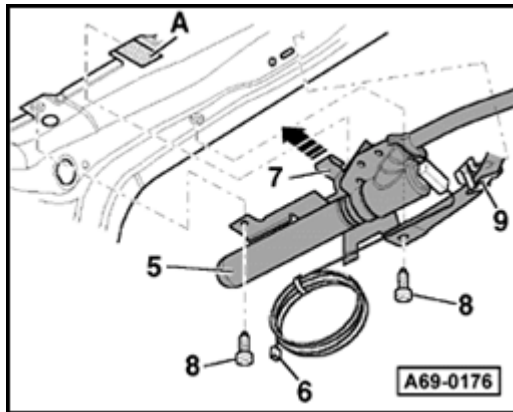
69-97

**5 - Igniter****6 - Side curtain airbag harness connector****7 - Retaining tab****8 - Bolts (2x)**

- ◆ 4 Nm (35 in. lb)
- ◆ Self-locking
- ◆ Always replace
- ◆ Always clean threaded holes for drive flange bolts (e.g. using tap)
- ◆ Use VAS 5122 and VAG 1783

9 - Clip

69-98



A

Fig. 1 Igniter at D-pillar

- Remove bolts -8-.
- Remove airbag in direction of arrow.
- Cable rolled up in delivery condition.

5 - Igniter

6 - Harness connector

7 - Retaining tab

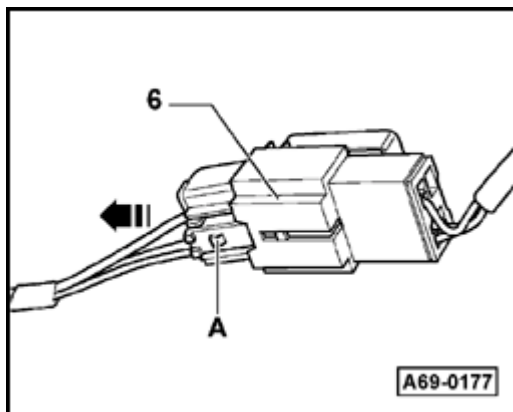
8 - Bolts (2x)

Use VAS 5122 and VAG 1783

Tightening torque: 4 Nm (35 in. lb)

9 - Clip

A - Felt



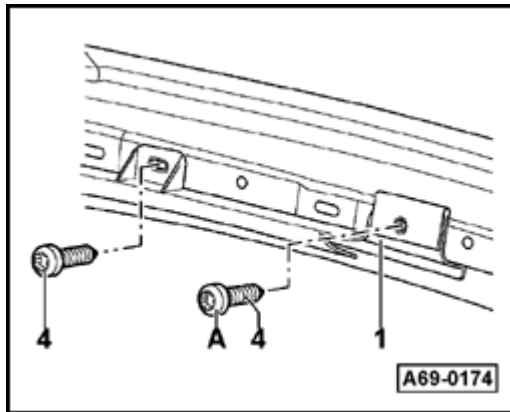
A

Fig. 2 Disconnecting harness connector for side curtain airbag

- Press catches -A- and disconnect harness connector in direction of arrow.

6 - Side curtain airbag harness connector

69-99



A

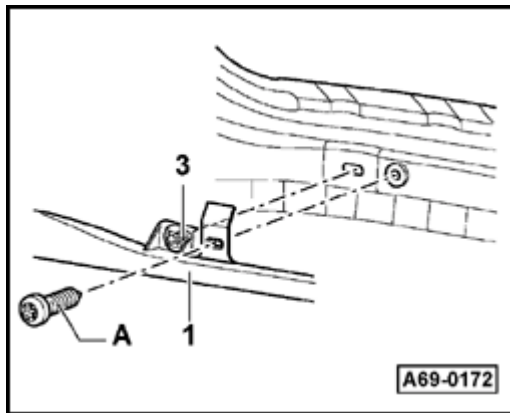
Fig. 3 Side curtain airbag at lower A-pillar

- Install lower bolt -A- first.

1 - Side curtain airbag

4 - Bolts (2x)

Tightening torque: 4 Nm (35 in. lb)



A

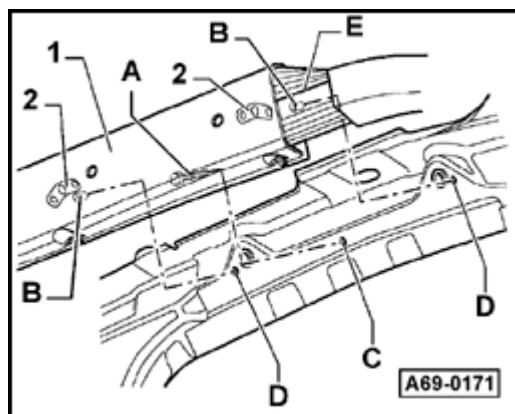
Fig. 4 Side curtain airbag at upper A-pillar

- Engage clip -3-

- Bolt -A- must be attached along with A-pillar trim panel.

1 - Side curtain airbag

3 - Clip



A

Fig. 5 Mounting side curtain airbag at roof grab handle

Front and rear roof grab handles are mounted the same way.

- Insert pre-assembly clip -A- into mounting point -C-.
- Insert pins -B- in mounting points -D-.
- Twist-securing seam -E- must face center of vehicle.

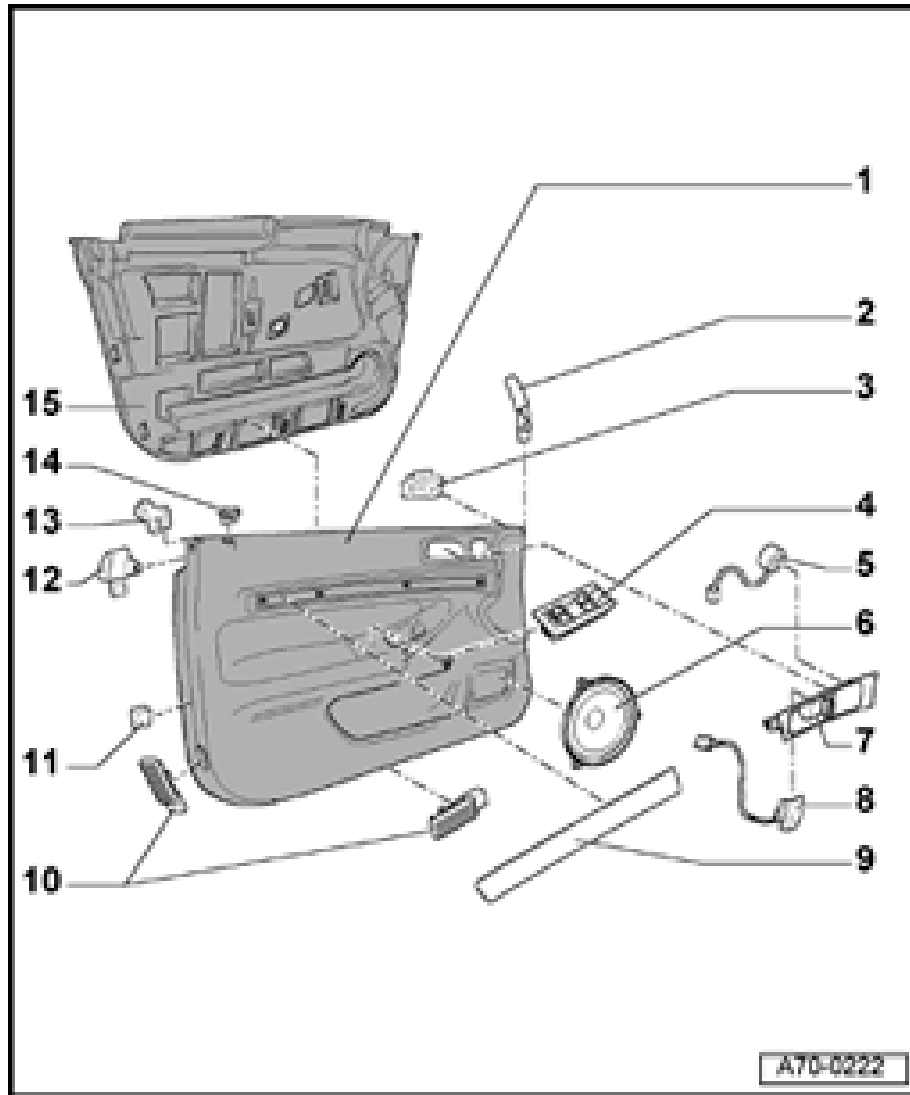
1 - Side curtain airbag

2 - Grip handle adapter, delivery casing airbag

Notes:

- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, window regulators) according to the repair manual and/or Owner's Manual.*
- ◆ *If the airbag Malfunction Indicator Lamp (MIL) -K75- indicates a malfunction, the DTC memory must be erased and then checked again using the VAG 1551 scan tool.*

⇒ [Repair Manual, Body On Board Diagnostic \(OBD\), Repair Group 01](#)



Front door trim

Component locations, overview

1 - Door trim

◆ Removing ⇒ [page 70-3](#)

2 - Outer connecting piece

3 - Outer filler piece

4 - Power window switch insert

◆ Driver-side ⇒ [page 70-9](#)

◆ Passenger-side ⇒ [page 70-10](#)

5 - Speaker (tweeter)

◆ Removing ⇒ [page 70-17](#)

6 - Speaker (woofer)

◆ Removing ⇒ [page 70-16](#)

7 - Interior door handle

◆ Removing ⇒ [page 70-19](#)

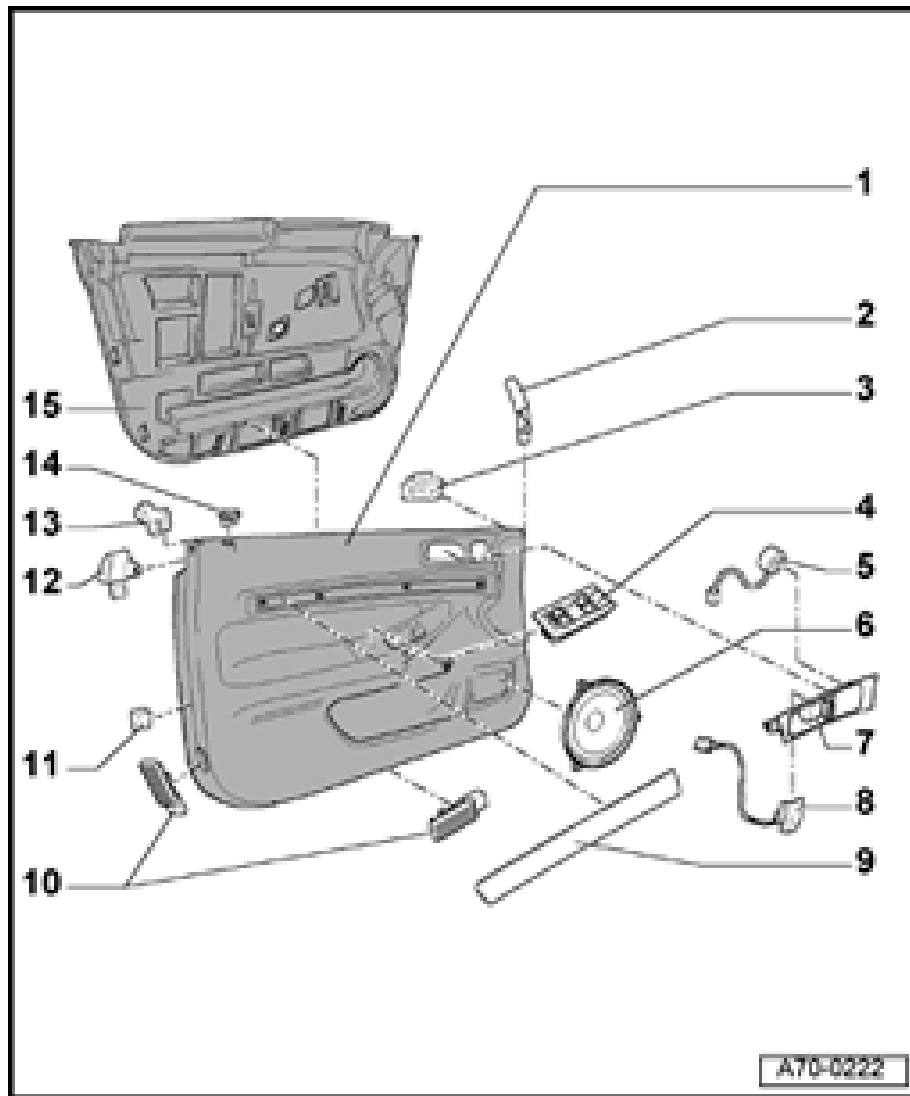
8 - Central door locking switch

◆ Driver-side only

◆ Removing ⇒ [page 70-15](#)

9 - Trim

◆ Removing ⇒ [page 70-18](#)

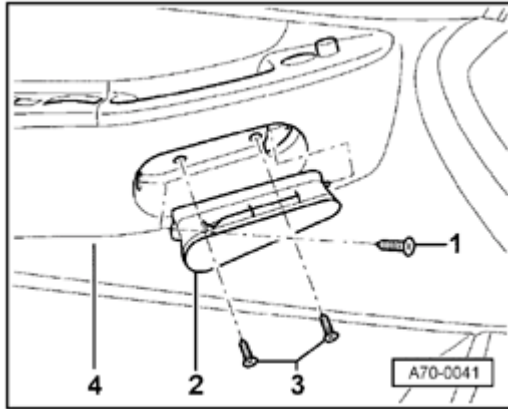
**10 - Door warning and footwell lights**

◆ Removing and installing ⇒ [page 70-33](#)

11 - Detent notch base**12 - Inner connecting piece****13 - Inner filler piece****14 - Door knob guide****15 - Front door trim insulation**

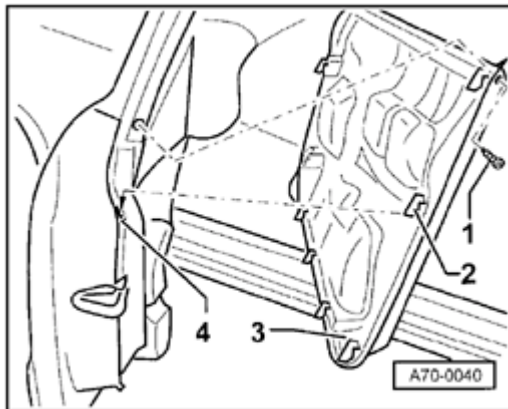
◆ Removing and installing ⇒ [page 70-5](#)

Front door trim, removing and installing



- Remove bolt -1-.
- Tightening torque: 1.5 Nm (13 in. lb)
- Pull handle shell -2- downward out of door trim -4-.
- Remove bolts -3- (2x).
- Tightening torque: 2.5 Nm (22 in. lb)

Vehicles with manual window crank ⇒ [page 70-6](#) .

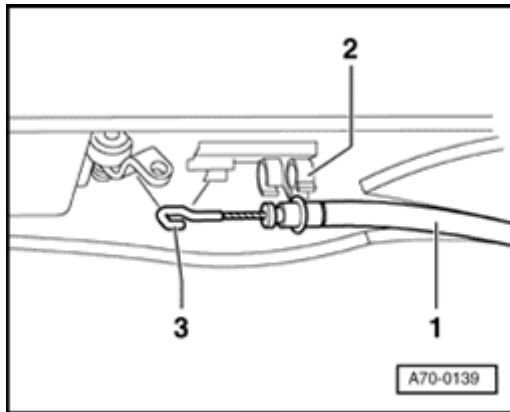


- Remove bolts -1- (2x).
- Tightening torque: 1.5 Nm (13 in. lb)
- Lift door trim -3- up and out of door shell.
- To install, bases -4- for detent notches -2- (7x) must be installed.

Note:

The Bowden cable for the inside door mechanism and the electrical harness connectors are not disconnected until after removing door trim -3-.

70-4



A

- Pull Bowden cable -1- out of guide -2- and remove.

Note:

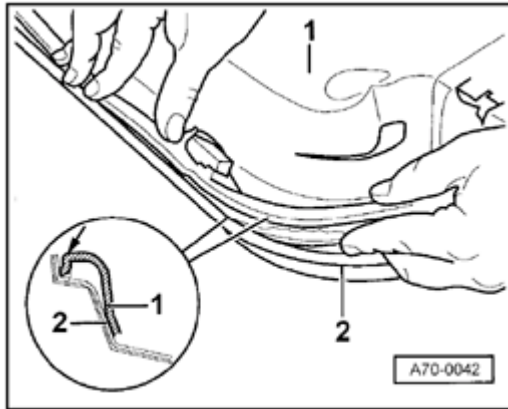
When installing make sure that hook -3- faces upward.

- Disconnect electrical harness connectors.

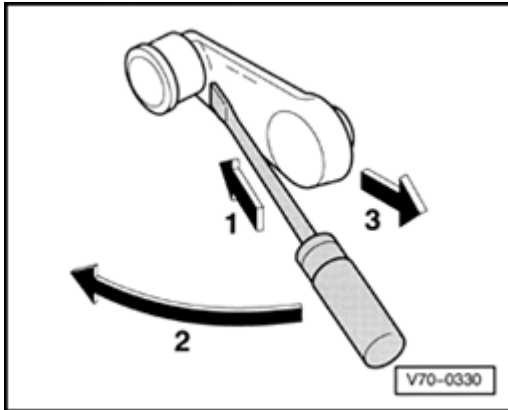
Front door trim insulation, removing and installing

A

- Insulation -1- must be inserted into door trim -2- all around.
- When removing or installing insulation -1-, ensure that insulation is not damaged when installing it over retaining tabs or electrical harness connectors.

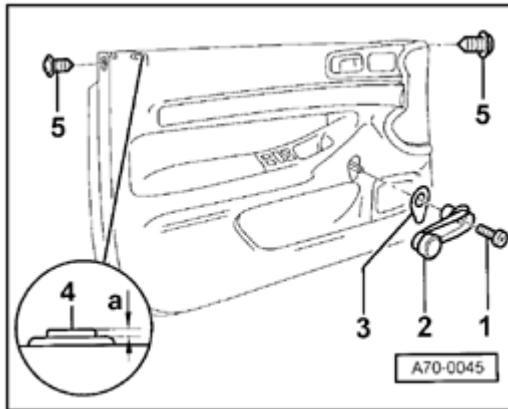


Front manual window cranks, removing and installing



A

- Press in flat side of flat-head screwdriver in direction of arrow -1-.
- Rotate flat-head screwdriver in direction of arrow -2-.
- Pull off cover in direction of arrow -3-.



A

- Remove bolt -1-.
- Tightening torque: 2.5 Nm (22 in. lb)
- Remove manual window crank -2- and base -3-.

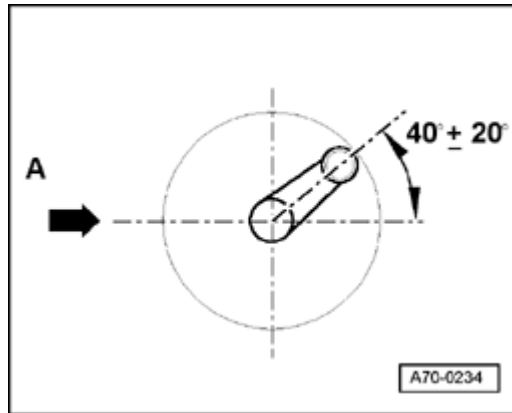
Front door manual window crank installation position



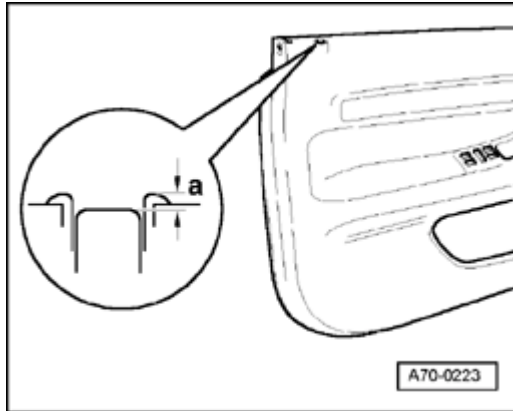
Illustration shows left manual window crank (right side is mirror of left).

A - Driving direction

Installation position shown: window closed



Release button, adjusting

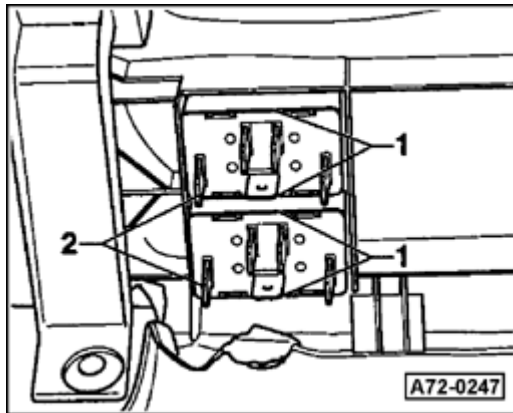


4

- When locked, release lever must not project more than dimension -a-.
- Dimension -a-: 0-2 mm countersunk

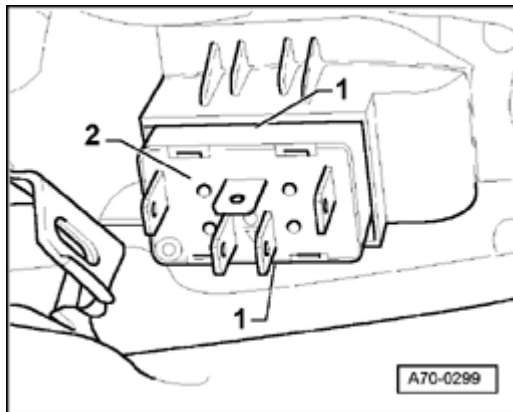
Driver-side power window switches, removing and installing

- Remove door trim ⇒ [page 70-3](#) .
- Remove insulation ⇒ [page 70-5](#) .
- Remove vapor barrier ⇒ [page 70-12](#) .
- Use screwdriver to remove retaining tabs -1-.
- Remove power window switches -2-.



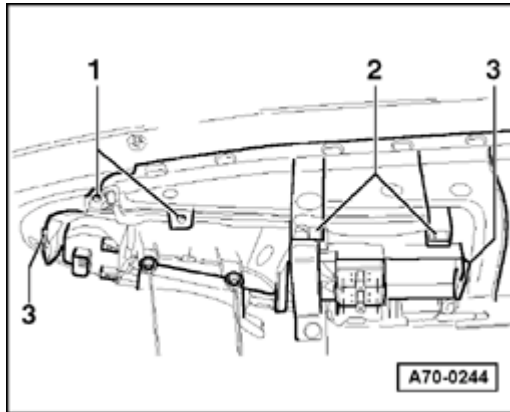
Passenger-side power window switch, removing and installing

- Remove door trim ⇒ [page 70-3](#) .
- Remove insulation ⇒ [page 70-5](#) .
- Use screwdriver to release retaining tabs -1-.
- Remove power window switches -2-.



Grip handle cover with power window switch unit and power mirror switch, removing and installing

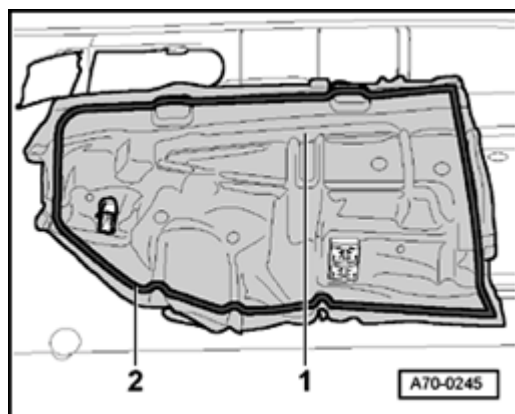
- Remove door trim ⇒ [page 70-3](#) .
- Remove insulation ⇒ [page 70-5](#) .
- Remove vapor barrier ⇒ [page 70-12](#) .

**A**

- Remove bolts -1- (2x).
Tightening torque: 1.5 Nm (13 in. lb)
- Release retaining tabs -2- (2x) and clips -3- (2x).
- Remove grip handle cover forward.

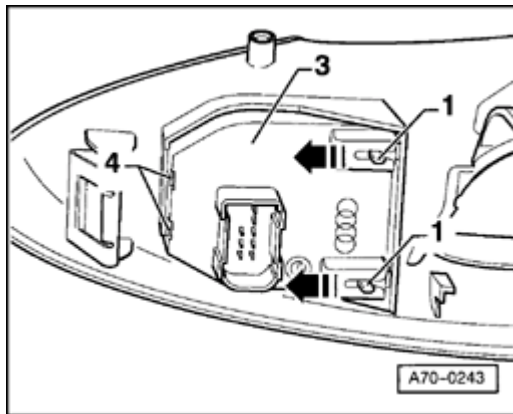
Vapor barrier, removing

- Remove door trim ⇒ [page 70-3](#) .
- Remove insulation ⇒ [page 70-5](#) .
- To install, press in vapor barrier -1- in area of adhesive bead -2-.
- Push power window electrical harness connectors through vapor barrier.



Power mirror switch, removing and installing

- Remove door trim ⇒ [page 70-3](#) .
- Remove grip handle cover ⇒ [page 70-11](#) .
- Press pins -1- (2x) in direction of arrow.
- Remove retaining tabs -2-.
- Remove power mirror switch -3-.

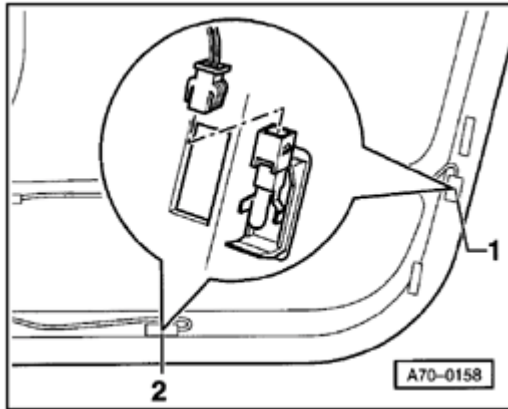


70-14

Door warning light and footwell lights, removing and installing

A

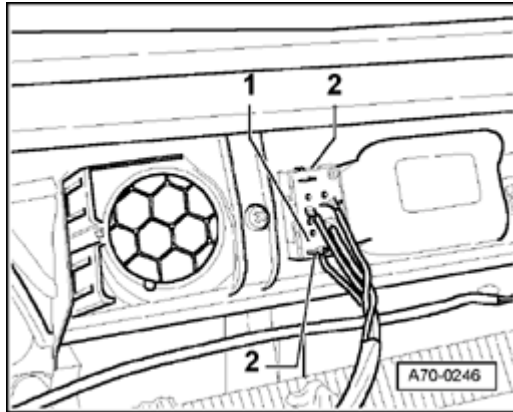
- Detach door warning light -1- from below using screwdriver and remove toward outside together with cable.
- Disconnect door warning light -1-.
- Detach footwell lighting -2- from front using screwdriver and remove toward outside together with cable.
- Disconnect footwell lighting -2-.



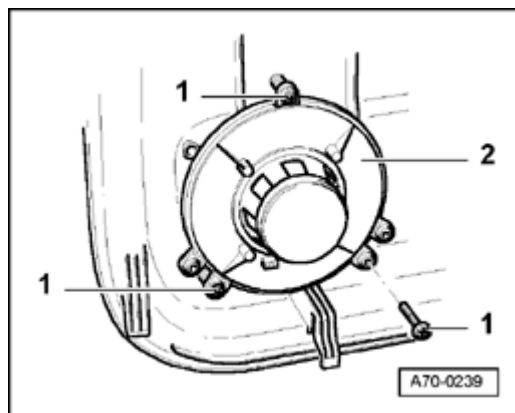
Central door locking switch, removing

4

- Remove door trim ⇒ [page 70-3](#) .
- Remove insulation ⇒ [page 70-5](#) .
- Using screwdriver, detach retaining tabs (2x) and remove central door locking switch toward rear.



Bass speaker, removing



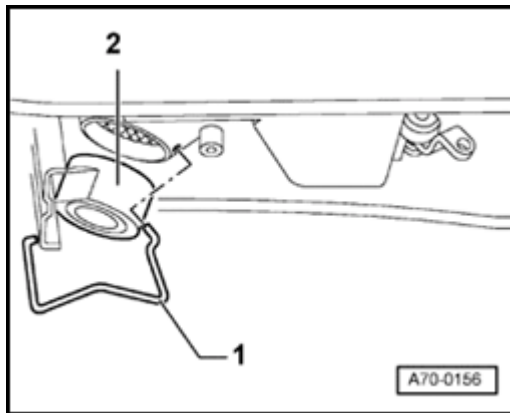
- Remove door trim ⇒ [page 70-3](#) .
- Remove insulation ⇒ [page 70-5](#) .
- Remove bolts -1- (3x).

Tightening torque: 1.5 Nm (13 in. lb)

- Remove bass speaker -2-.

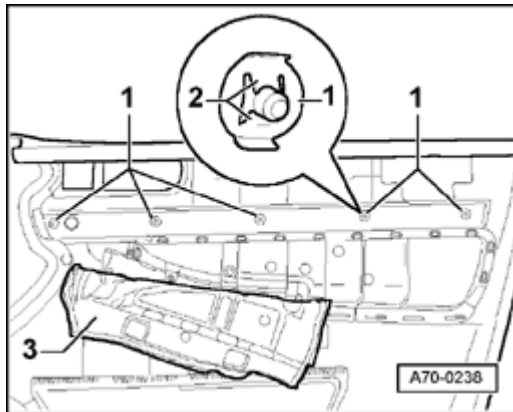
Tweeter, removing and installing

- Remove door trim ⇒ [page 70-3](#) .
- Remove insulation ⇒ [page 70-5](#) .
- Pull wiring from door trim up to bass speaker.
- Remove interior door handle ⇒ [page 70-19](#) .
- Using screwdriver, detach bracket -1-.
- Remove tweeter -2-.



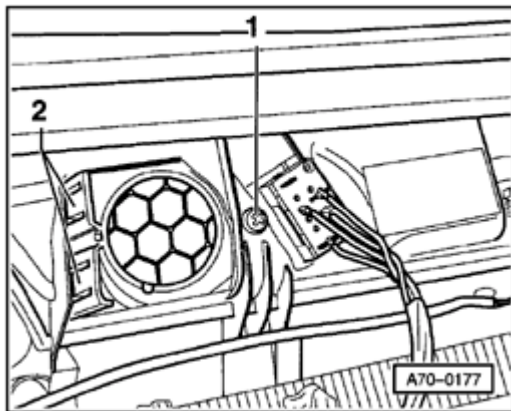
Trim panel in door trim, removing

- Remove door trim ⇒ [page 70-3](#) .
- Remove insulation ⇒ [page 70-5](#) .
- Pull vapor barrier -3- down in area of trim.
- Carefully open clips -2- of clips -1-.
- Remove trim panel.



Interior door handle, removing

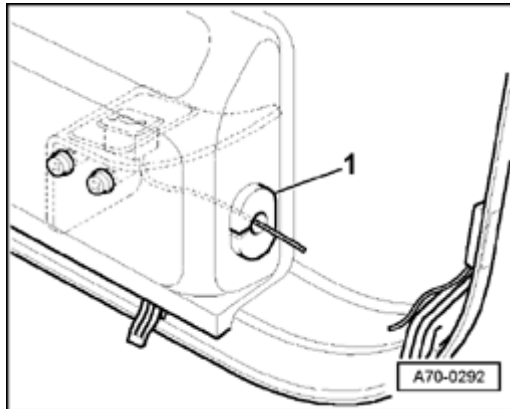
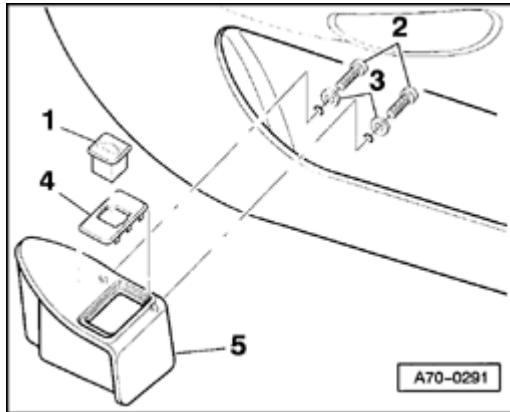
- Remove door trim ⇒ [page 70-3](#) .
- Remove tweeter ⇒ [page 70-17](#) .
- Remove central door locking switch (driver-side only) ⇒ [page 70-15](#) .
- Remove bolt -1-.
- Press retaining tabs -2- (2x) and remove interior door handle toward front.



4

Console and trunk release switch, removing

- Remove door trim ⇒ [page 70-3](#) .
- Remove bolts -2- (2x).
- Remove console -5-.
- Disconnect harness connector from switch -1-.
- Remove trim panel -4- together with switch -1-.

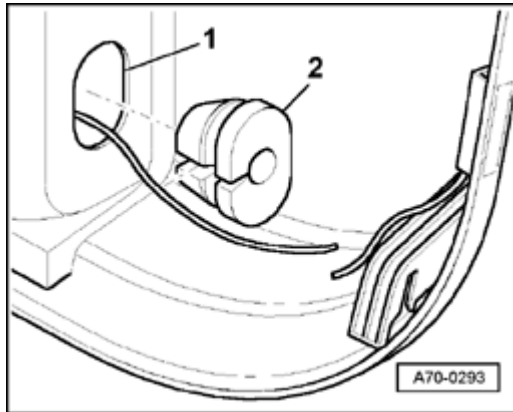


- Remove grommet -1-.

70-21

Door trim for trunk release switch, cutting out

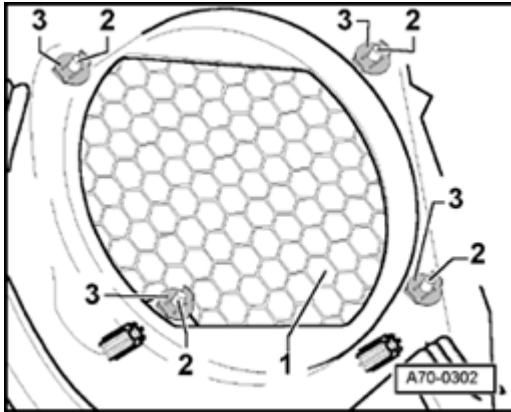
The area to be cut out -1- is indicated on door trim.



- Cut out area using available tools.
- Install grommet -2-.

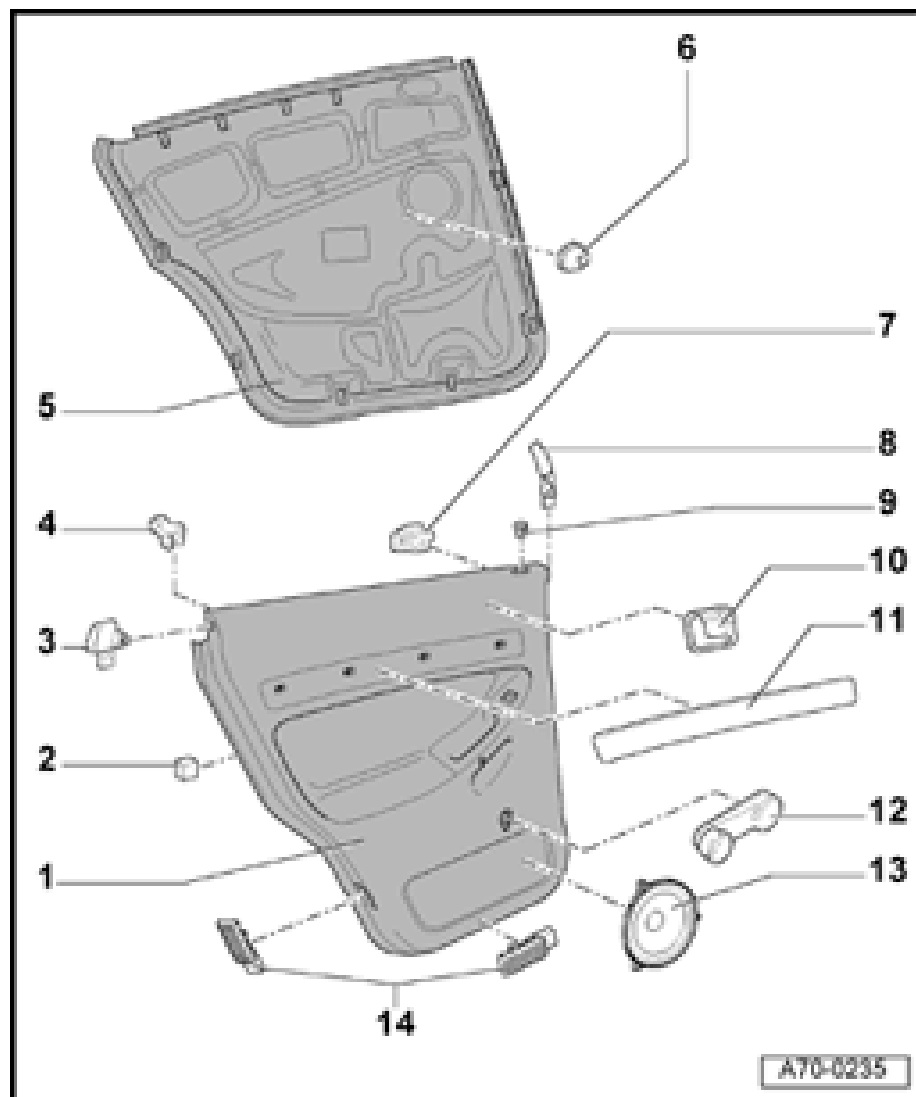
70-22

Switching speaker trim (Normal, Bose)



4

- Drill out old speaker trim -1- at -2- (4x).
- Insert speaker trim -1- from front and secure speaker trim -1- with clips -3- (4x).



Rear door trim

Component locations, overview

1 - Door trim

♦ Removing installing ⇒ [page 70-25](#)

2 - Clip locator

3 - Outer connecting piece

4 - Outer filler piece

5 - Rear door trim insulation

♦ ⇒ [page 70-37](#)

6 - Foam seal

7 - Inner filler piece

8 - Inner connecting piece

9 - Guide for locking knob

10 - Interior door handle

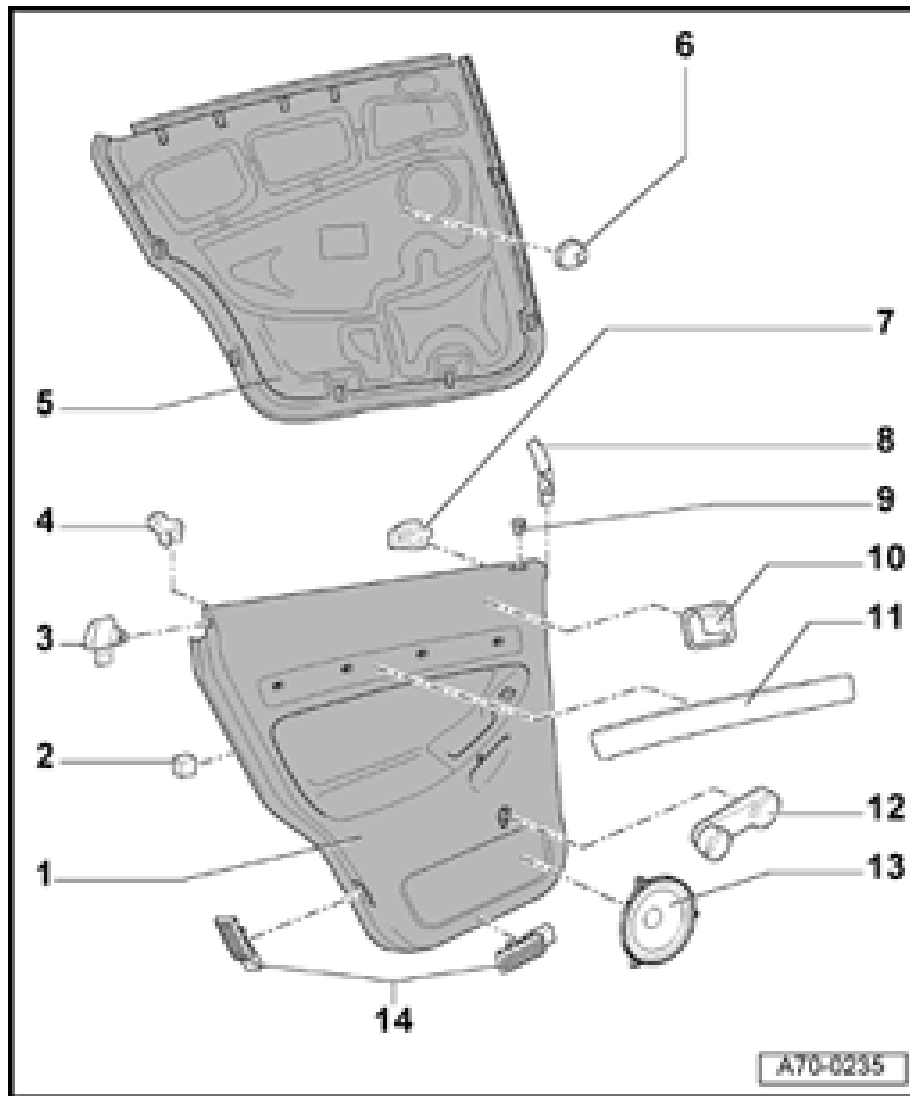
♦ Removing ⇒ [page 70-27](#)

11 - Trim panel

♦ Removing ⇒ [page 70-36](#)

12 - Window crank handle

70-24

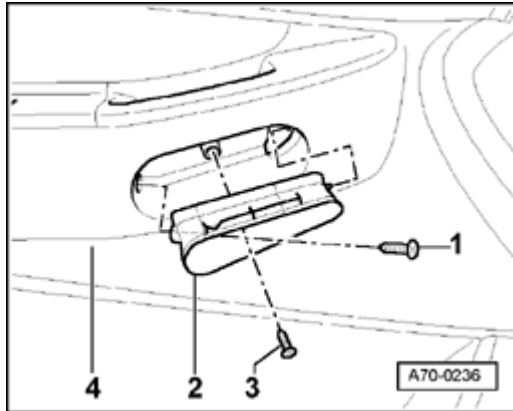
**13 - Speaker (woofer)**

◆ Removing ⇒ [page 70-16](#)

14 - Door warning and footwell lights

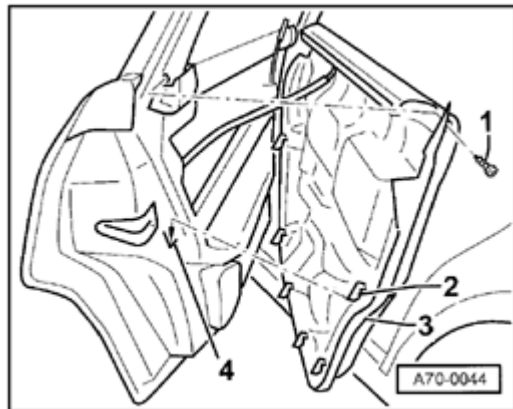
◆ Removing ⇒ [page 70-33](#)

Rear door trim, removing and installing



- Remove bolt -1-.
- Tightening torque: 1.5 Nm (13 in. lb)
- Pull handle shell -2- downward out of door trim -4-.
- Remove nut -3- (1x).
- Tightening torque: 2.5 Nm (22 in. lb)

Vehicles with manual window crank ⇒ [page 70-28](#) .

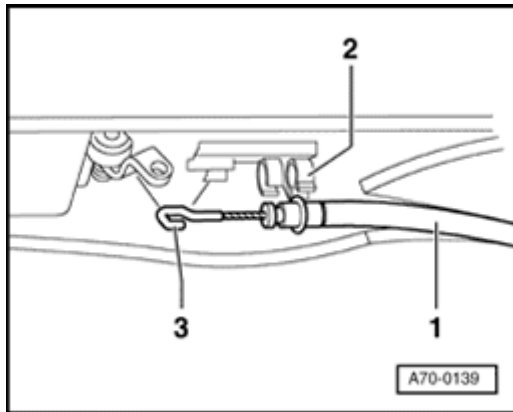


- Remove bolts -1- (2x).
- Tightening torque: 1.5 Nm (13 in. lb)
- Lift door trim -3- up and out of door shell.
- To install, bases -4- for detent notches -2- (7x) must be fully installed.

Note:

The Bowden cable for the inside door mechanism and the electrical harness connectors are not disconnected until after removing door trim -3-.

70-26



A

- Pull Bowden cable -1- out of guide -2- and remove.

Note:

When installing, make sure that hook -3- faces upward.

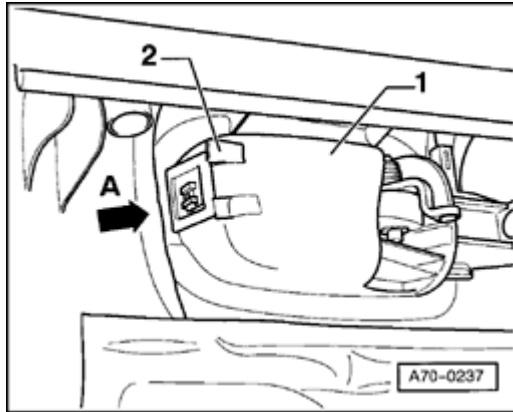
- Disconnect electrical harness connectors.

Interior door handle, removing

- Remove door trim ⇒ [page 70-25](#) .

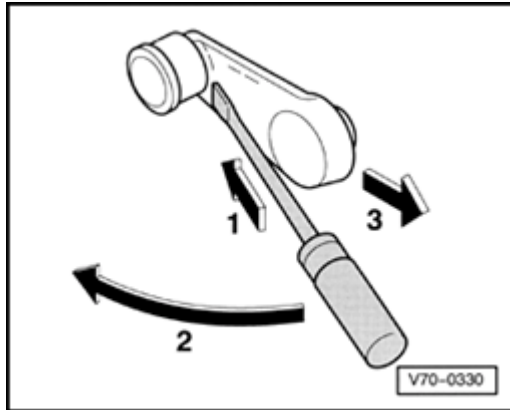
4

- Press spring -2- in direction of arrow -A- and remove interior door handle -1- toward front.



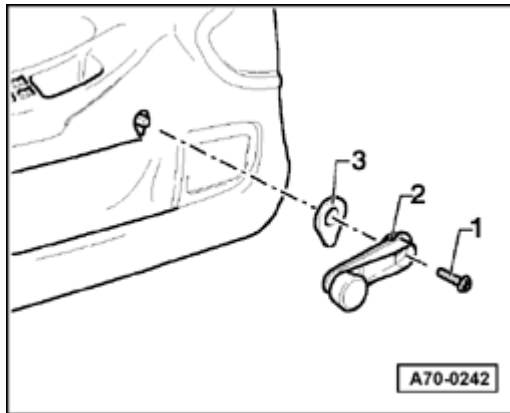
70-28

Rear manual window crank, removing and installing



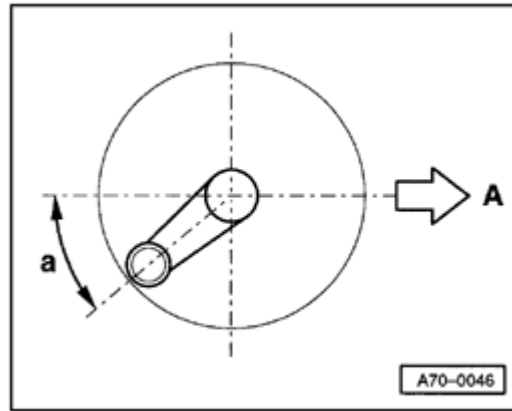
A

- Press in flat side of flat-head screwdriver in direction of arrow -1-.
- Rotate flat-head screwdriver in direction of arrow -2-.
- Pull off cover in direction of arrow -3-.



A

- Remove bolt -1-.
- Tightening torque: 2.5 Nm (22 in. lb)
- Remove manual window crank -2- and base -3-.



Rear door manual window crank installation position

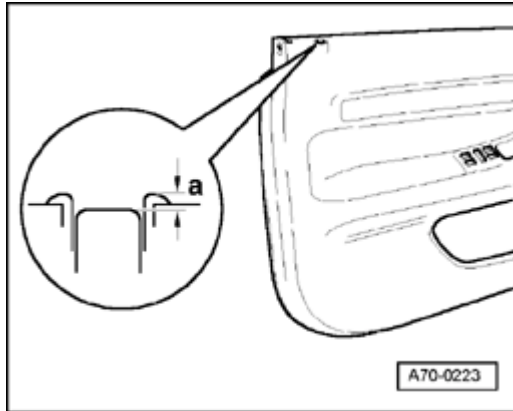


Illustration shows left manual window crank (right-side is mirror of left).

A - Driving direction

a - Installation position with window closed, at $40^\circ \pm 20^\circ$ angle toward rear.

Release button, adjusting

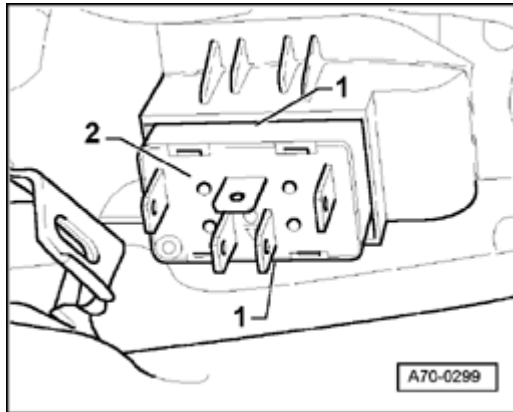


4

- When locked, release lever must not project more than dimension -a-.
- Dimension -a-: 0-2 mm countersunk

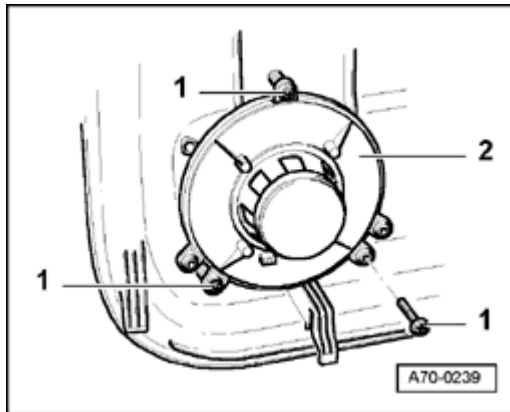
Power window switch, removing and installing

- Remove door trim ⇒ [page 70-25](#) .
- Remove insulation ⇒ [page 70-37](#) .
- Use screwdriver to remove retaining tabs -1-.
- Remove power window switches -2-.



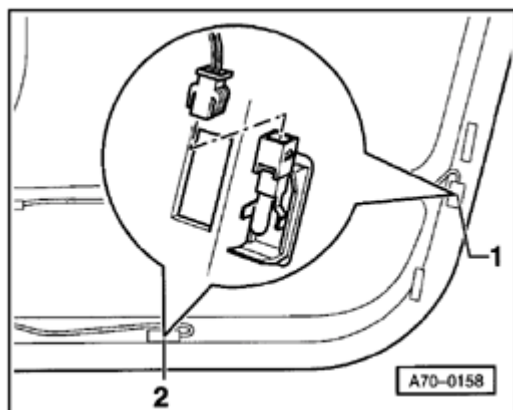
Bass speaker, removing

- Remove door trim ⇒ [page 70-25](#) .
- Remove insulation ⇒ [page 70-37](#) .
- Remove bolts -1- (3x).
Tightening torque: 1.5 Nm (13 in. lb)
- Remove bass speaker -2-.



70-33

Door warning light and footwell lights, removing and installing

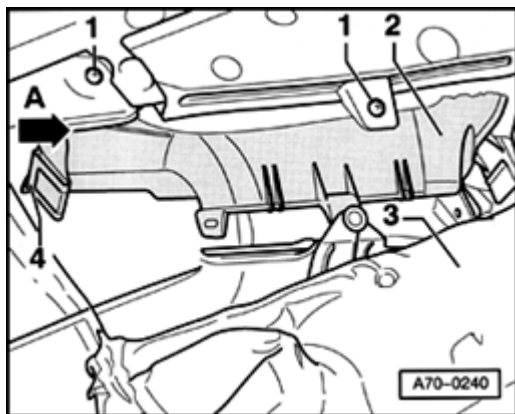


A

- Detach door warning light -1- from below using screwdriver and remove toward outside together with cable.
- Disconnect door warning light -1-.
- Detach footwell lights -2- from front using screwdriver and remove toward outside together with cable.
- Disconnect footwell lights -2-.

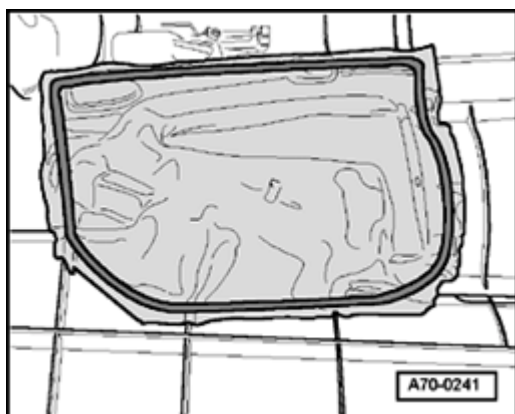
Grip handle cover with power window switch unit, removing and installing

- Remove door trim ⇒ [page 70-25](#) .
- Remove insulation ⇒ [page 70-37](#) .
- Pull vapor barrier -3- down in area of trim.
- Remove bolts -1- (2x).
Tightening torque: 1.5 Nm (13 in. lb)
- Press both sides of spring -4- in direction of arrow -A-, and remove grip handle cover -2-.



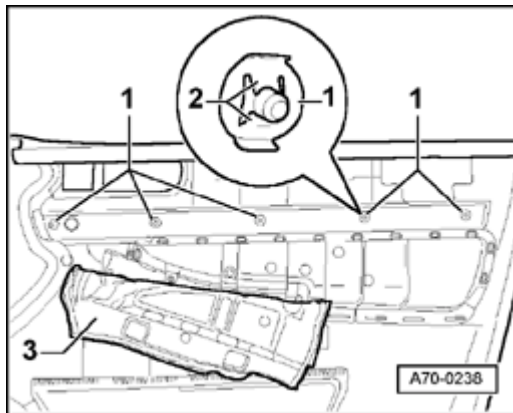
Vapor barrier, removing

- Remove door trim ⇒ [page 70-25](#) .
- Remove insulation ⇒ [page 70-37](#) .
- To install, press in vapor barrier -1- in area of adhesive bead -2-.
- Push power window electrical harness connectors through vapor barrier.



Tim panel in door trim, removing

- Remove door trim ⇒ [page 70-25](#) .
- Remove insulation ⇒ [page 70-37](#) .
- Pull vapor barrier -3- down in area of trim.
- Carefully open clips -2- of clips -1-.
- Remove trim panel.

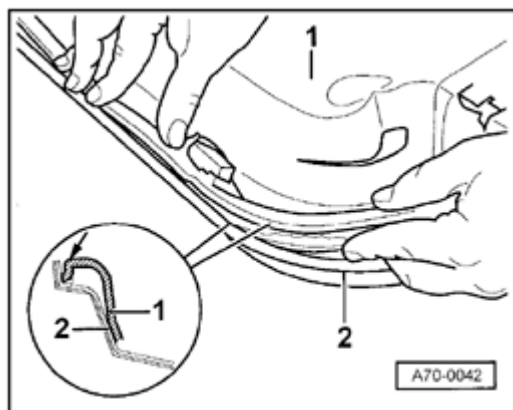


70-37

Rear door trim insulation, removing and installing

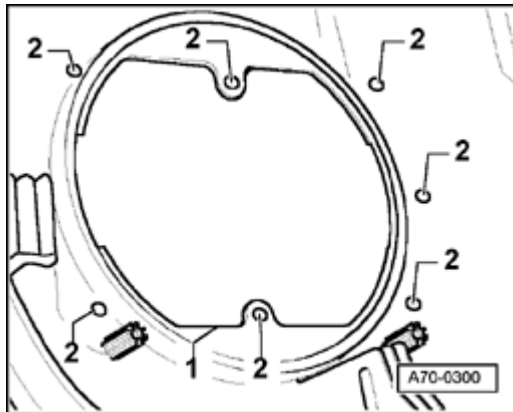
A

- Insulation -1- must be inserted into door trim -2- all around.
- When removing or installing insulation -1-, ensure insulation is not damaged when installing it over retaining tabs or electrical harness connectors.



70-38

Door trim replacement panel for speaker, cutting out

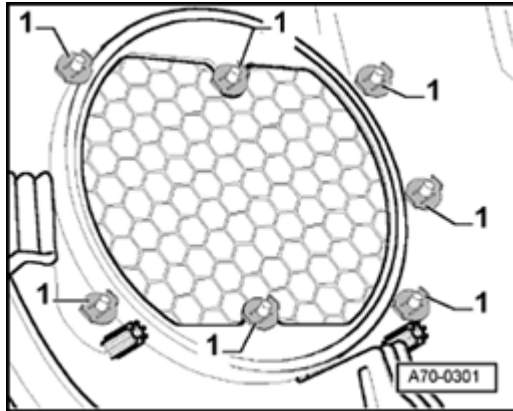


A

- Cut out trim at marking -1- using available tools.
- Drill trim at -2- (7x) using 5 mm drill bit.

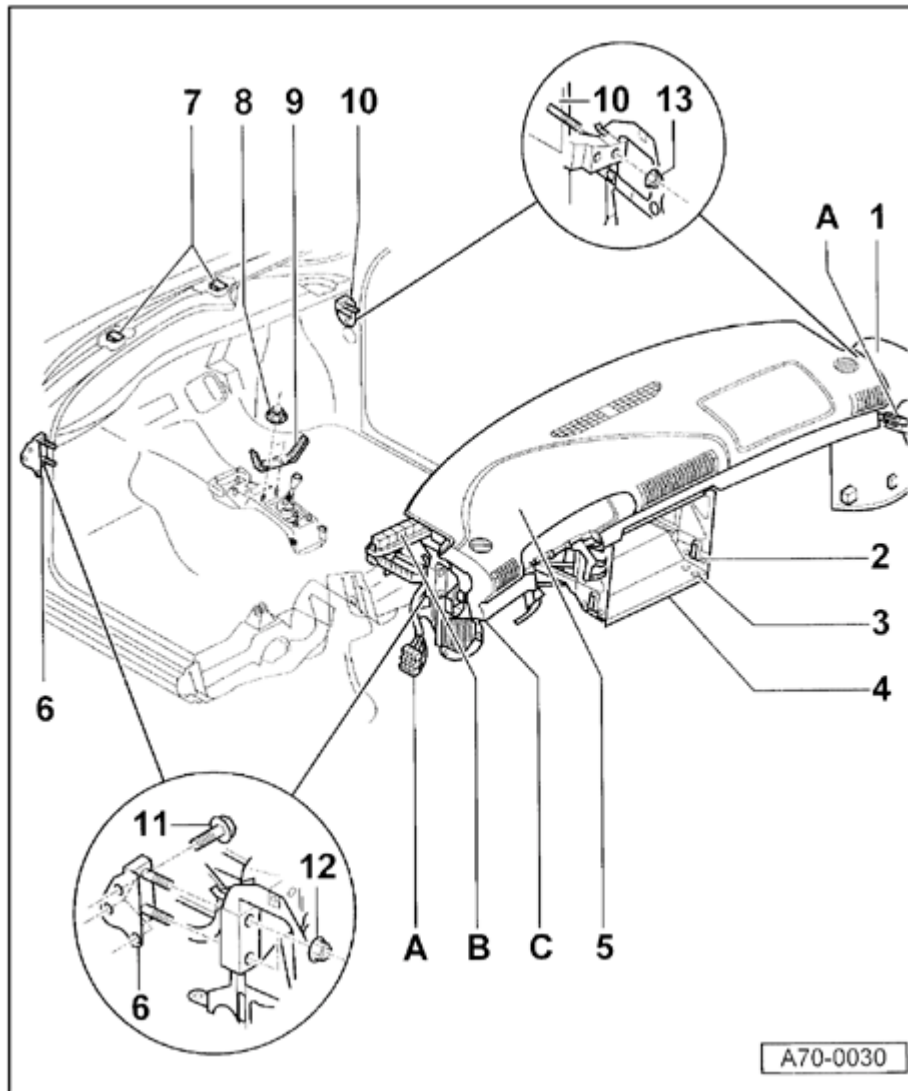
70-39

Speaker trim, installing



- Insert speaker trim from front and secure speaker trim with clips -1- (7x).

70-40



Instrument panel

Instrument panel (with cross member), removing and installing

1 - Cap for instrument panel (2x)

- ◆ Unclip cap

2 - Bolt (4x)

- ◆ 12 Nm (9 ft lb)

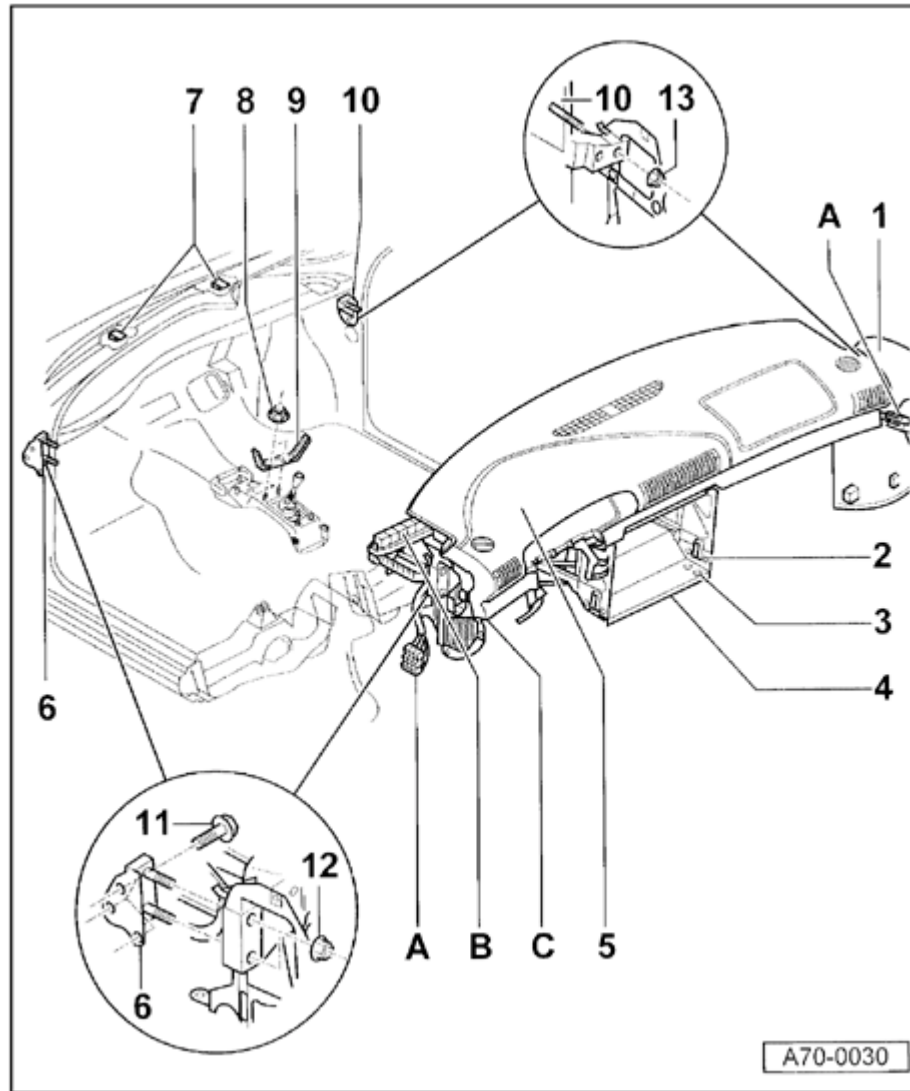
3 - Bolt (4x)

- ◆ 12 Nm (9 ft lb)

4 - Bracket

- ◆ Remove bolts -2- and -3-.

70-41



5 - Instrument panel with cross member

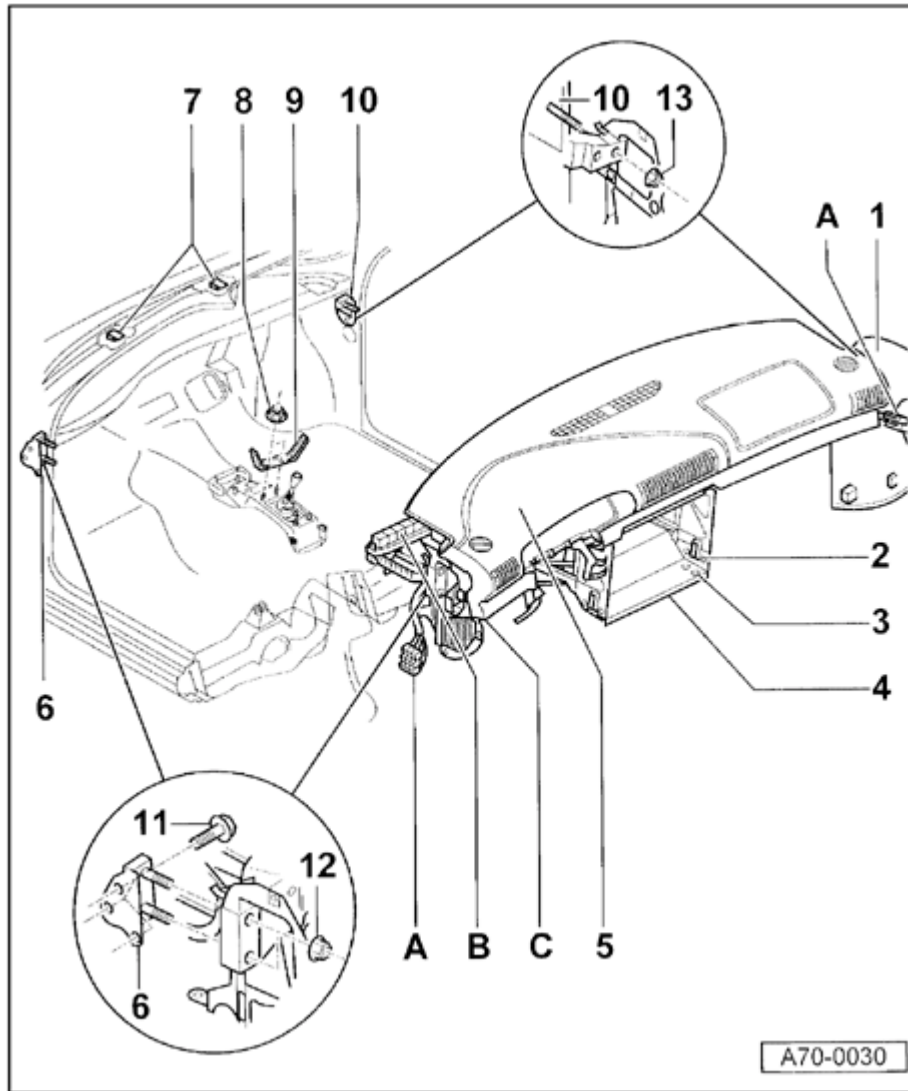
Removing:

- Position windshield wipers to upper-most position.
- Remove steering column brace ⇒ [Fig. 2](#).
- Remove steering wheel ⇒ [page 69-57](#).
- Remove driver-side airbag unit ⇒ [page 69-54](#).
- Remove driver-side knee bolster ⇒ [page 68-8](#).
- Remove passenger-side knee bolster ⇒ [page 68-1](#).
- Remove rear center console ⇒ [page 68-13](#).
- Remove front center console ⇒ [page 68-30](#).
- Remove instrument panel center piece ⇒ [page 68-31](#).
- Remove airbag control module ⇒ [page 69-74](#).
- Disconnect left and right-rear heating ducts in floor well.
- Disconnect coolant hoses and A/C lines (evacuate refrigerant).

⇒ [Repair Manual, Heating & Air Conditioning,
Repair Group 87](#)

- Remove rubber grommet.
- Remove lower A-pillar trim ⇒ [page 70-72](#) .

70-42



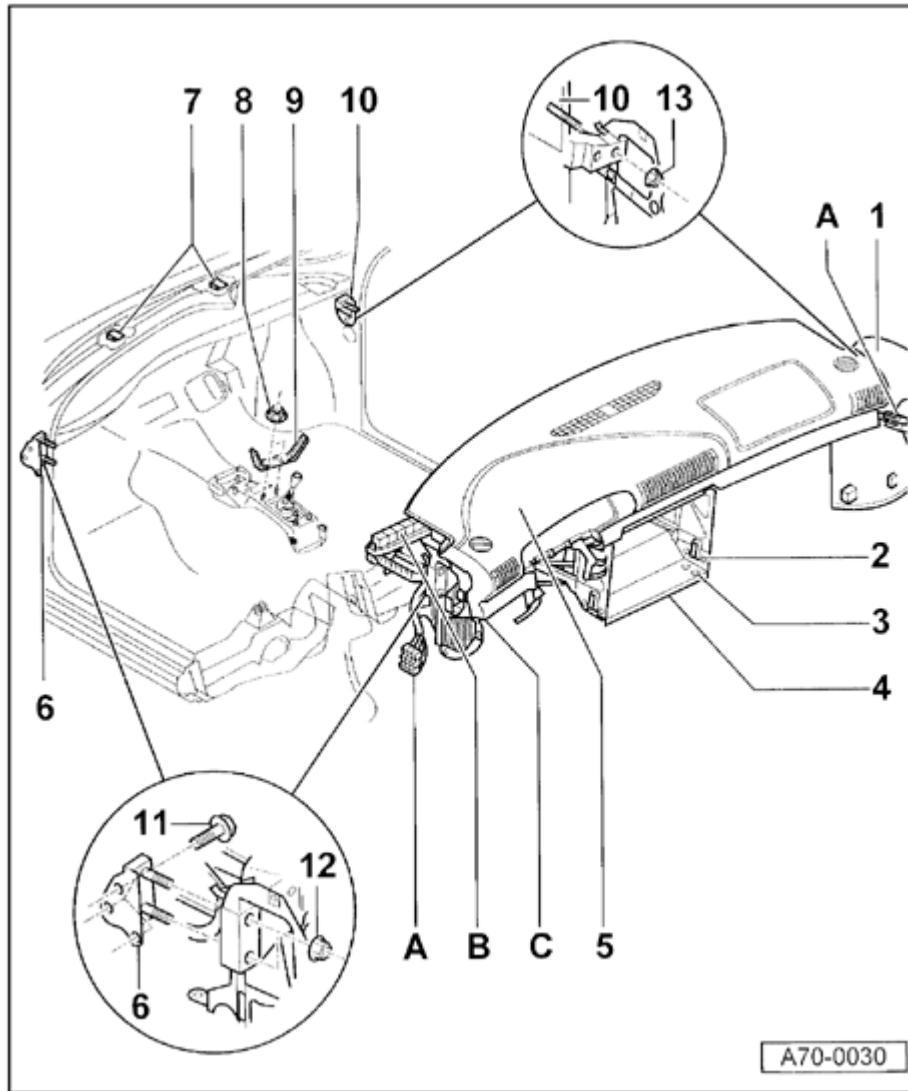
- Disconnect wiring at connector stations in left and right A-pillars (item -A-).
- Disconnect electrical harness connectors in item -B-.

⇒ [Repair Manual, Electrical Equipment, Repair Group 97.](#)

- Disconnect positive wiring at relay station (item -C-).
- Disconnect negative connection (item -C-).
- Disconnect wiring in area of center tunnel.
- Disconnect electrical and vacuum connections for brake light switch and cruise control system at pedal assembly.
- Remove bolts -2- and -3- as well as bracket -4-.
- Remove nuts -8- and bracket -9-.
- Disconnect pedal assembly from instrument panel cross member ⇒ [Fig. 1](#).
- Disconnect lower part of steering column from steering gear and secure ⇒ [Fig. 1](#).
- Remove nuts -12- and -13-.

- Cover both seats to protect them from damage.
- Pull instrument panel forward and pull out clips -7- with help from second technician.

70-43



Installing:

- ◆ Installation is the reverse of removal

Adjusting:

- ◆ Instrument panel with cross member must be centered in vehicle

6 - Angle bracket

- ◆ With felt base

7 - Retaining clip (2x)

8 - Nut (2x)

9 - Bracket

10 - Angle bracket

11 - Bolts (5x)

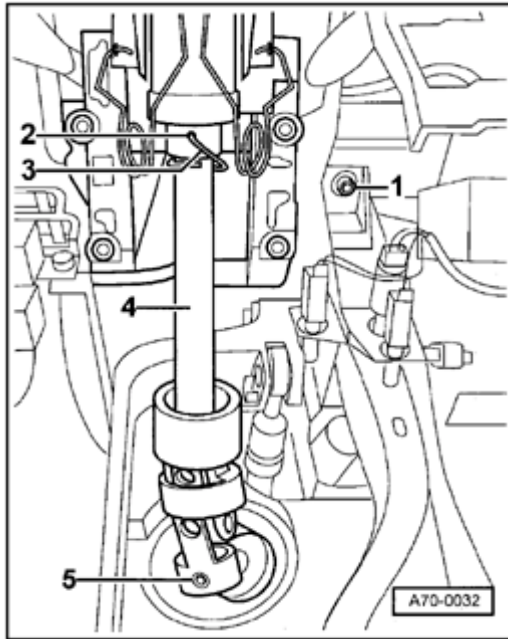
- ◆ Left-side (3x)
- ◆ Right-side (2x)
- ◆ 23 Nm (17 ft lb)

12 - Nut (2x)

- ◆ 45 Nm (33 ft lb)

13 - Nut (2x)

- ◆ 45 Nm (33 ft lb)

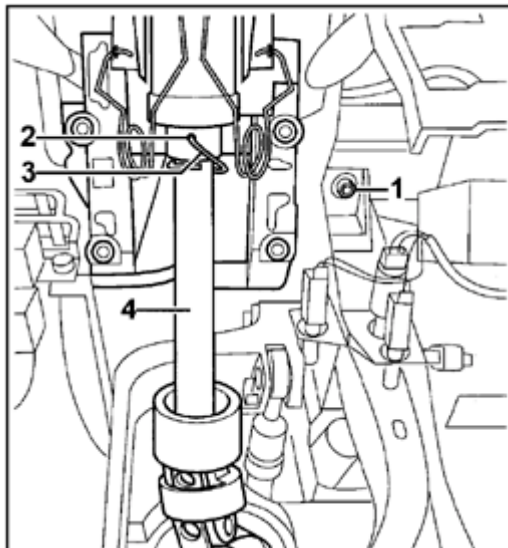


A

Fig. 1 Disconnecting pedal assembly

- Remove bolt -1-.

Tightening torque: 25 Nm (18 ft lb)



A

Removing lower section of steering column

- Remove bolt -5- and fold down joint.

Tightening torque: 40 Nm (30 ft lb)

Note:

The steering column joint can only be attached in one position when

installing.

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 48.](#)

- Push back steering column (lower section) -4- until hole 2 in steering column (upper section) covers hole in steering column (lower section).
- Insert welding wire -3- in hole -2- and secure by wrapping once around steering column.

CAUTION!

Do NOT under any circumstances pull steering column -4- out completely or push it in completely (⇒ Repair Manual, Suspension, Wheels, Steering).

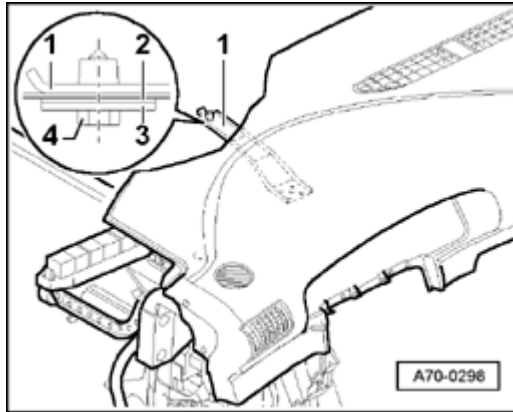
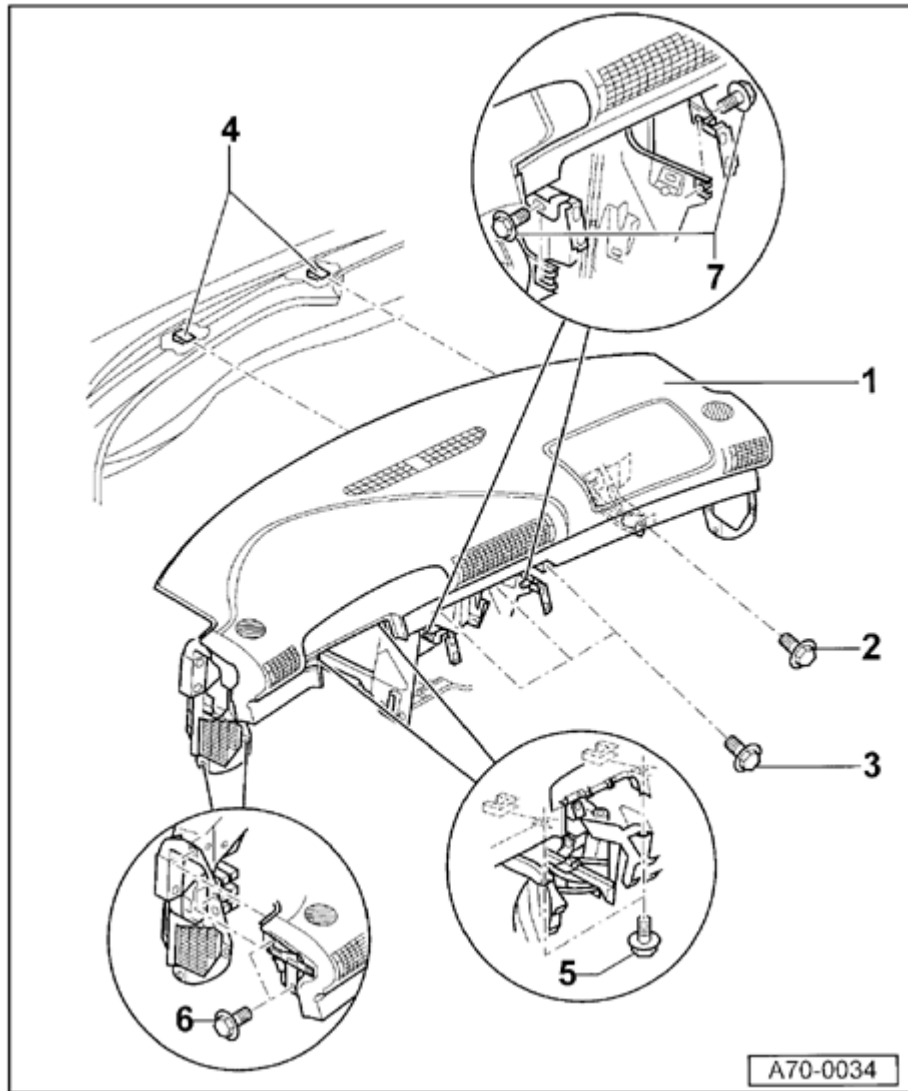


Fig. 2 Removing steering column brace

Note:

Steering column brace used 5/98 ➤; bolt for steering column brace is in the plenum panel, on the driver-side above the windshield wiper motor.

- Remove bolt -4-.
- Tightening torque: 8 Nm (71 ft lb)
- Remove washer -3- and gasket -2-.
- If necessary when installing, use drift to align brace -1- to hole in bulkhead.



Instrument panel, removing and installing

1 - Instrument panel

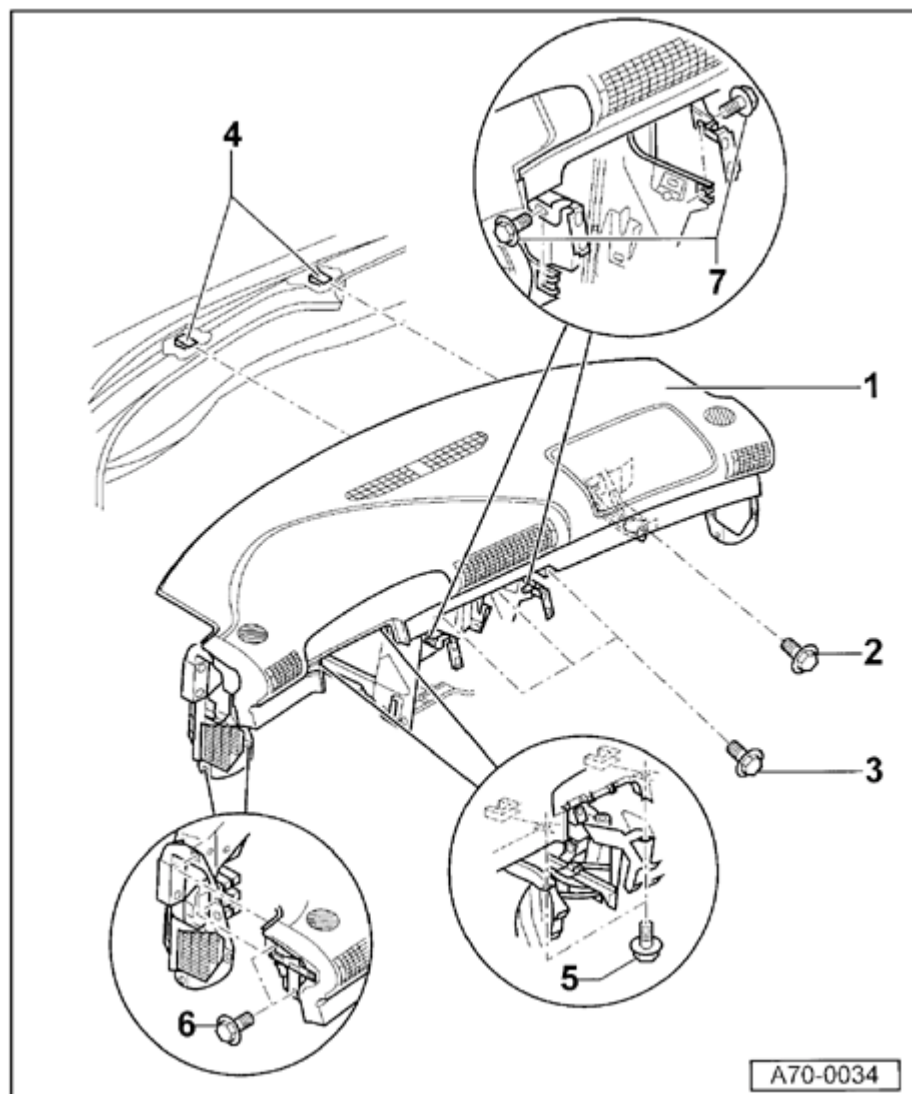
Removing:

- Remove driver-side knee bolster ⇒ [page 68-8](#) .
- Remove passenger-side knee bolster ⇒ [page 68-1](#) .
- Remove rear center console ⇒ [page 68-13](#) .
- Remove front center console ⇒ [page 68-30](#) .
- Remove instrument panel center piece ⇒ [page 68-31](#) .
- Remove driver-side airbag unit ⇒ [page 69-54](#) .
- Remove steering wheel ⇒ [page 69-57](#) .
- Remove passenger-side airbag unit ⇒ [page 69-70](#) .
- Remove steering column cover ⇒ [page 68-11](#) .
- Remove bolts -2-, -3-, -5-, -6-, and -7-.
- To remove, pull instrument panel out of brackets -4-.

Note:

Always replace instrument panel after passenger airbag has deployed.

70-47



Installing:

- ◆ Installation is the reverse of removal

Adjusting:

- ◆ Instrument panel must be centered in vehicle

2 - Bolt

- ◆ 5 Nm (44 ft lb)

3 - Bolts (3x)

- ◆ 5 Nm (44 ft lb)

4 - Brackets (2x)

- ◆ With felt base

5 - Bolts (2x)

- ◆ 5 Nm (44 ft lb)

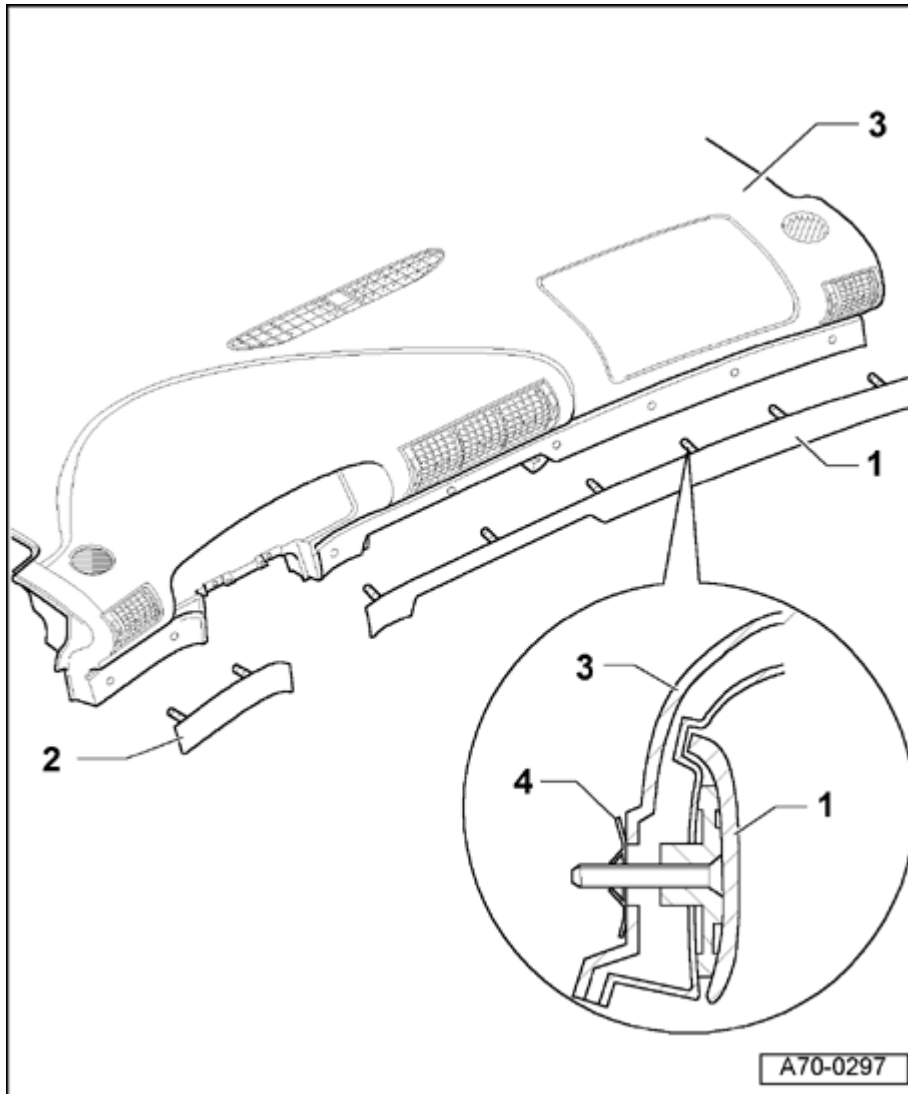
6 - Bolts (2x)

- Remove bolts on left and right-side of instrument panel.

- ◆ 5 Nm (44 ft lb)

7 - Bolts (2x)

- ◆ 5 Nm (44 ft lb)



Instrument panel trim, removing and installing

1 - Trim, passenger-side

- Remove driver-side knee bolster ⇒ [page 68-8](#) .
- Remove passenger-side knee bolster ⇒ [page 68-1](#) .
- Remove rear center console ⇒ [page 68-13](#) .
- Remove front center console ⇒ [page 68-30](#) .
- Remove instrument panel center piece ⇒ [page 68-31](#) .
- Remove clips -4- using screwdriver.

2 - Trim, driver-side

- Remove driver-side knee bolster ⇒ [page 68-8](#) .
- Remove clips -4- using screwdriver.

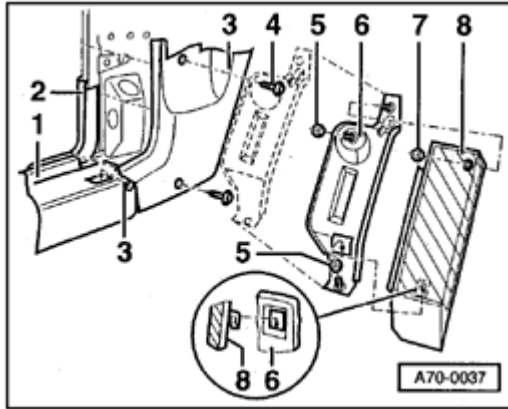
3 - Instrument panel

4 - Clip

70-72

Trim (general)

Lower A-pillar trim, removing and installing



- To remove, remove A-pillar bolts 4 (2x).
Tightening torque: 1.5 Nm (13 in. lb)
- Remove door seal -2- in area of A-pillar trim.
- Pull A-pillar trim -3- from door sill molding -1-.

Foot rest and foot rest support bracket, removing and installing

Removing foot rest

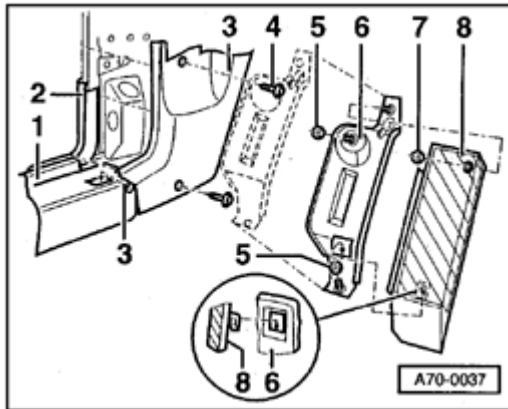
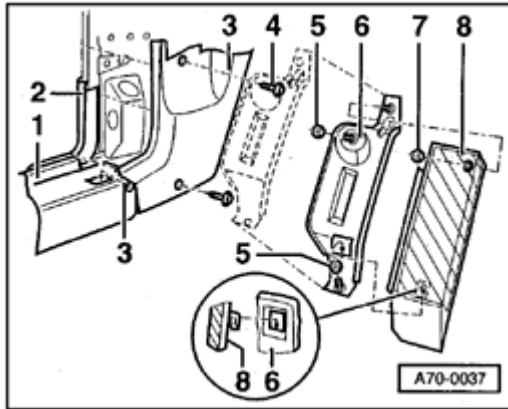


- Remove lower A-pillar trim ⇒ [page 70-72](#) .
- To remove foot rest -8-, remove nuts -7- and pull up and out of bracket -6-.

Removing foot rest support bracket



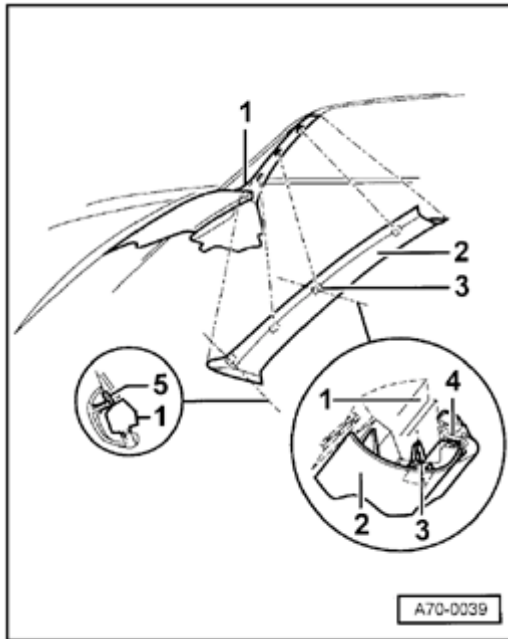
- Remove foot rest.
- Pull up floor mat in area near bracket for foot rest.
- To remove bracket -6-, remove nuts -5- (2x).

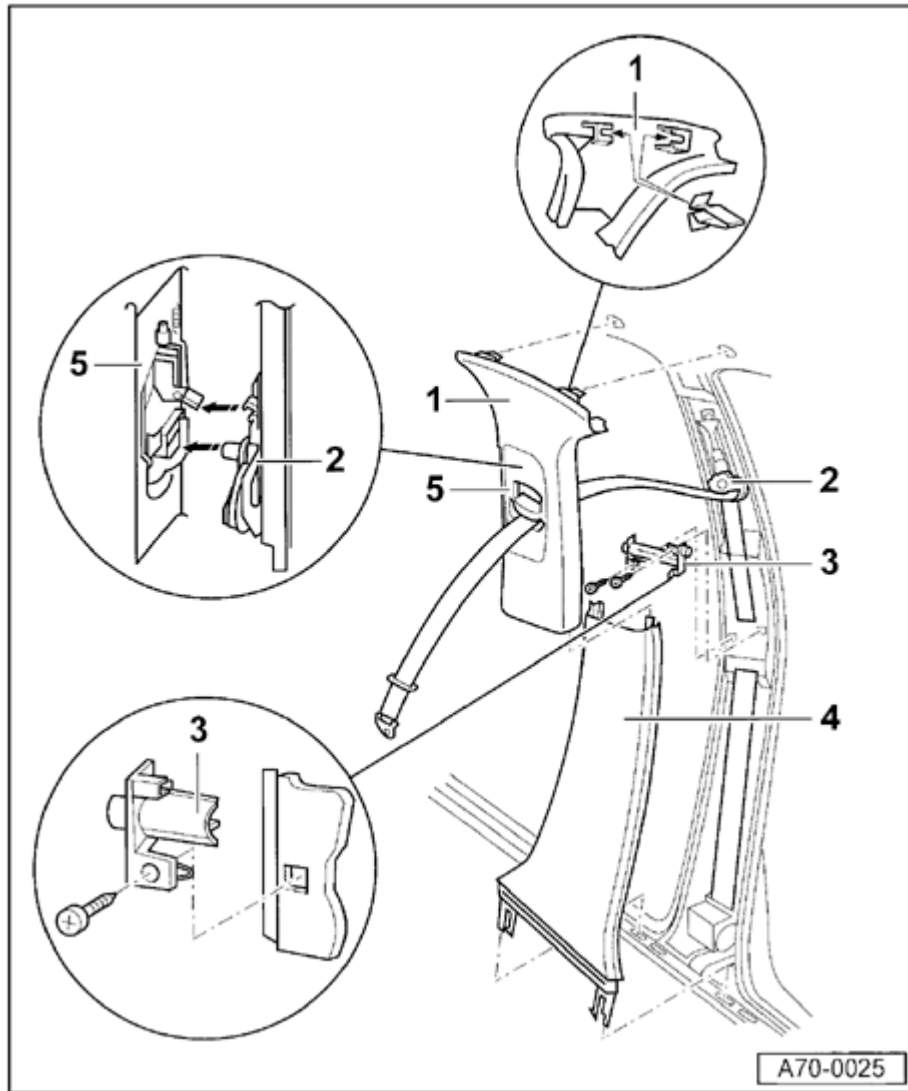


Upper A-pillar trim, removing and installing

A

- Unclip retaining clips -3- from top to bottom from A-pillar trim -2-.
- Door seal -4- must lie on top of A-pillar trim -2- as shown in magnified area.
- Insert lower A-pillar trim in retaining clips -5-.





B-pillar trim, removing and installing

1 - Upper B-pillar trim

Removing:

- Unclip upper B-pillar trim -1- ⇒ [Fig 2](#) .
- Pull B-pillar trim -1- upward out of B-pillar trim -4-.
- Disconnect three-point seat belt at door sill ⇒ [page 69-13](#) .
- Remove three-point seat belt from B-pillar trim -1-.

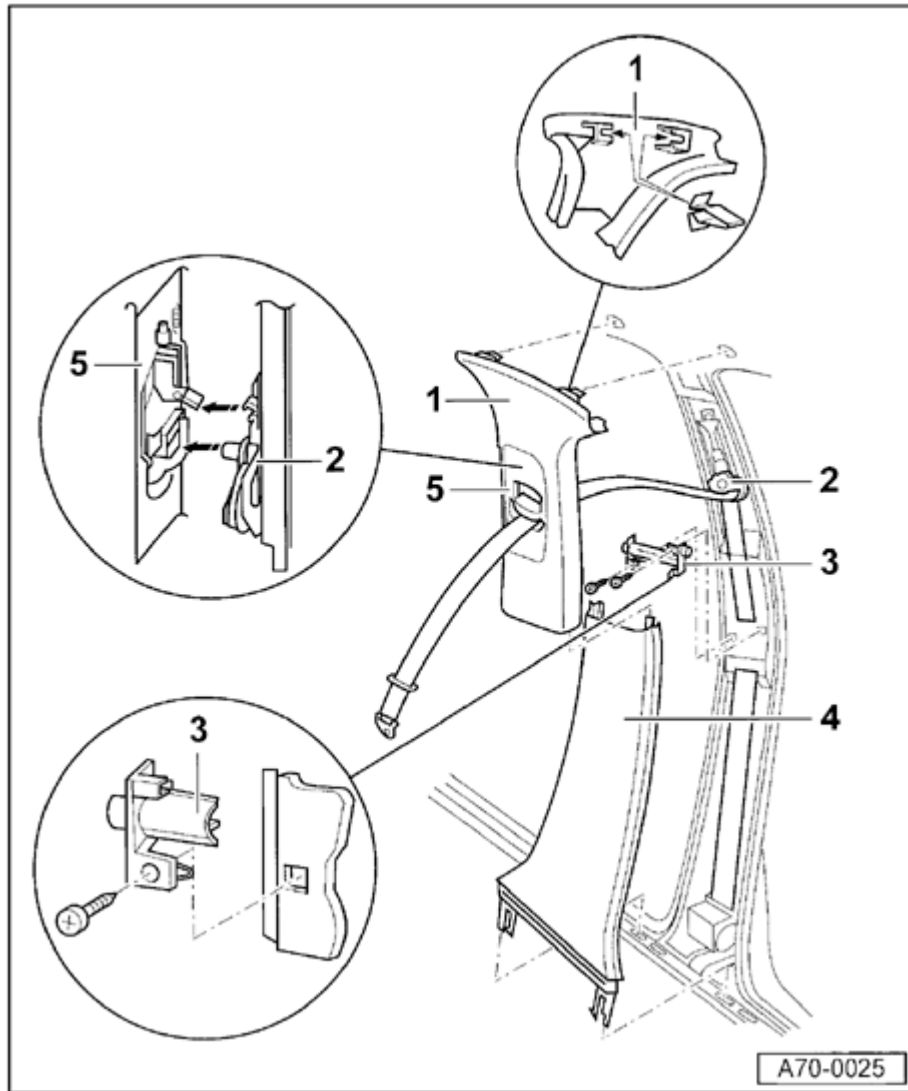
Installing:

- Insert B-pillar trim -1- into B-pillar trim -4- .

Note:

Do not press button when installing.

- Install upper B-pillar trim.
- Insert seat belt guide -5- into seat belt height adjuster ⇒ [Fig 1](#) .

**Notes:**

Function check after installing trim:

- ◆ *Height adjuster must audibly engage into all five of the possible positions (even in the top position).*
- ◆ *Switch must return by itself to released position after being actuated.*

2 - Anti-twist stop**3 - Belt guide****4 - Lower B-pillar trim**

Removing:

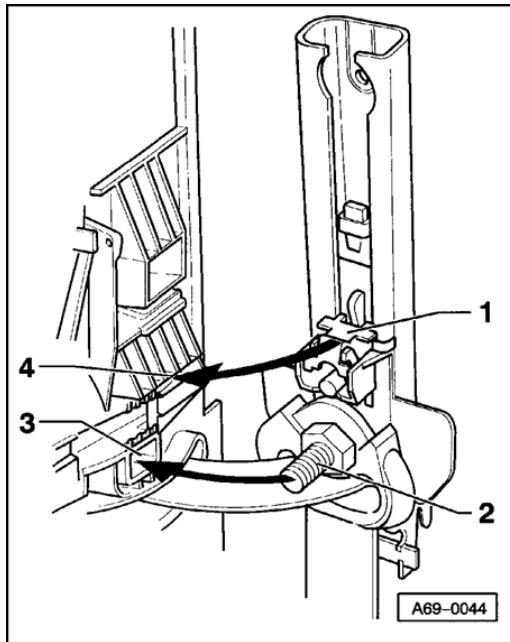
- Remove upper B-pillar trim -1- (do not detach three-point seat belt).
- Push back retaining tabs (2x) for B-pillar trim at door sill.
- Remove trim -4- upward and detach from belt guide -3-.

Installing:

- ◆ Installation is the reverse of removal

5 - Seat belt height adjuster trim

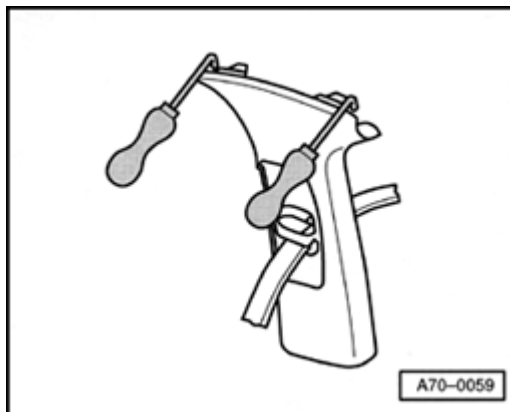
70-77



A

Fig. 1 Installing upper B-pillar trim in belt height adjuster

- Guide slide with button -4- (without pressing) beginning at top and working downward into release lever -1- of height adjuster, while simultaneously installing pin -2- into mounting -3-.



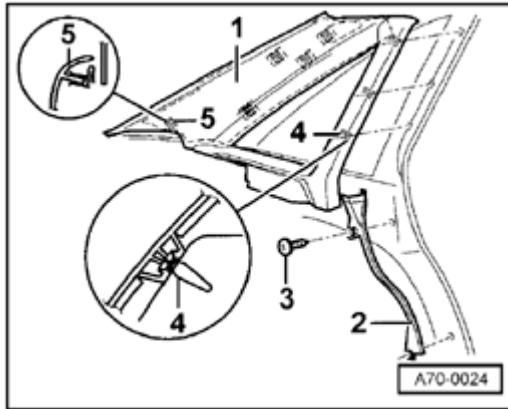
A

Fig. 2 Removing B-pillar trim

- To make removal easier, use two assembly hooks -2-.
- Install assembly hooks near retaining clips.

C/D-pillar trim, removing and installing

- Remove rear seatback.
- Detach trim -1- from top to bottom out of clips -4- (7x).
- Remove trim -1- upward and out of bracket -5-.



70-79

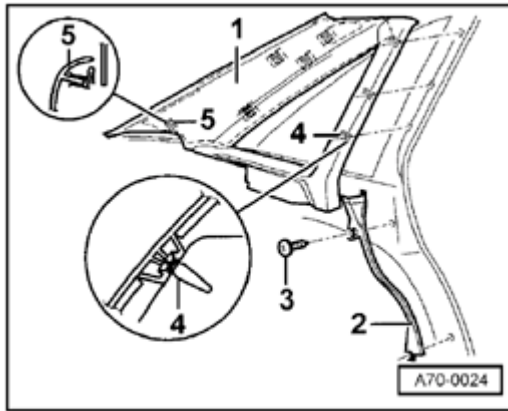
Lower C-pillar trim, removing and installing

- Remove rear seatback.

- Remove bolt -3-.

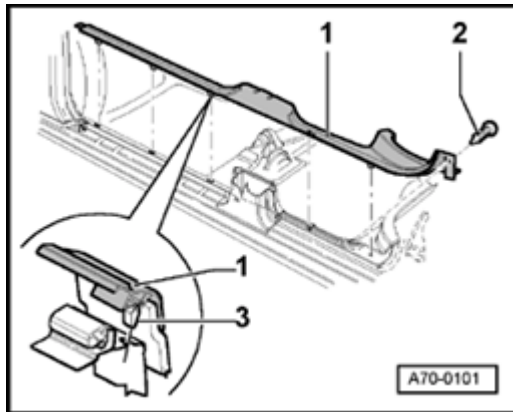
Tightening torque: 1.5 Nm (13 in. lb)

- Remove trim -2-.



Door sill, removing and installing

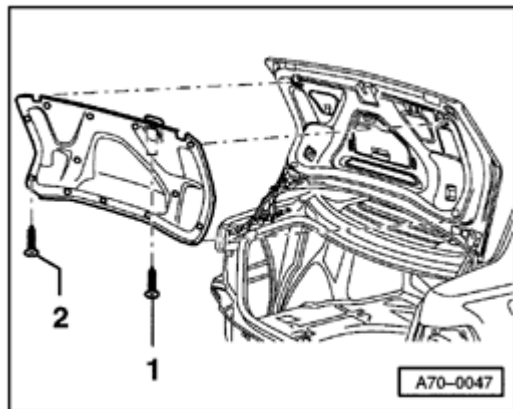
- Remove lower A-pillar trim.
- Remove metal screw -2-.
- Remove door sill -1- upward together with clips -3-.



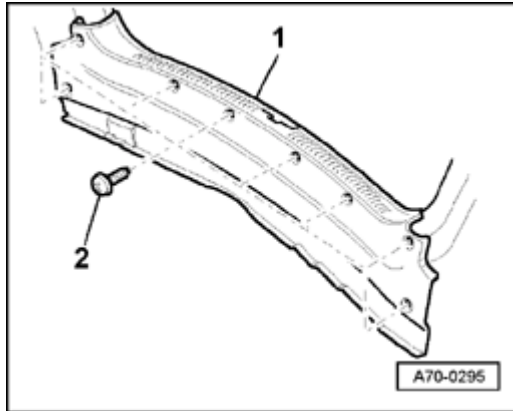
70-81

Trunk lid trim, removing and installing

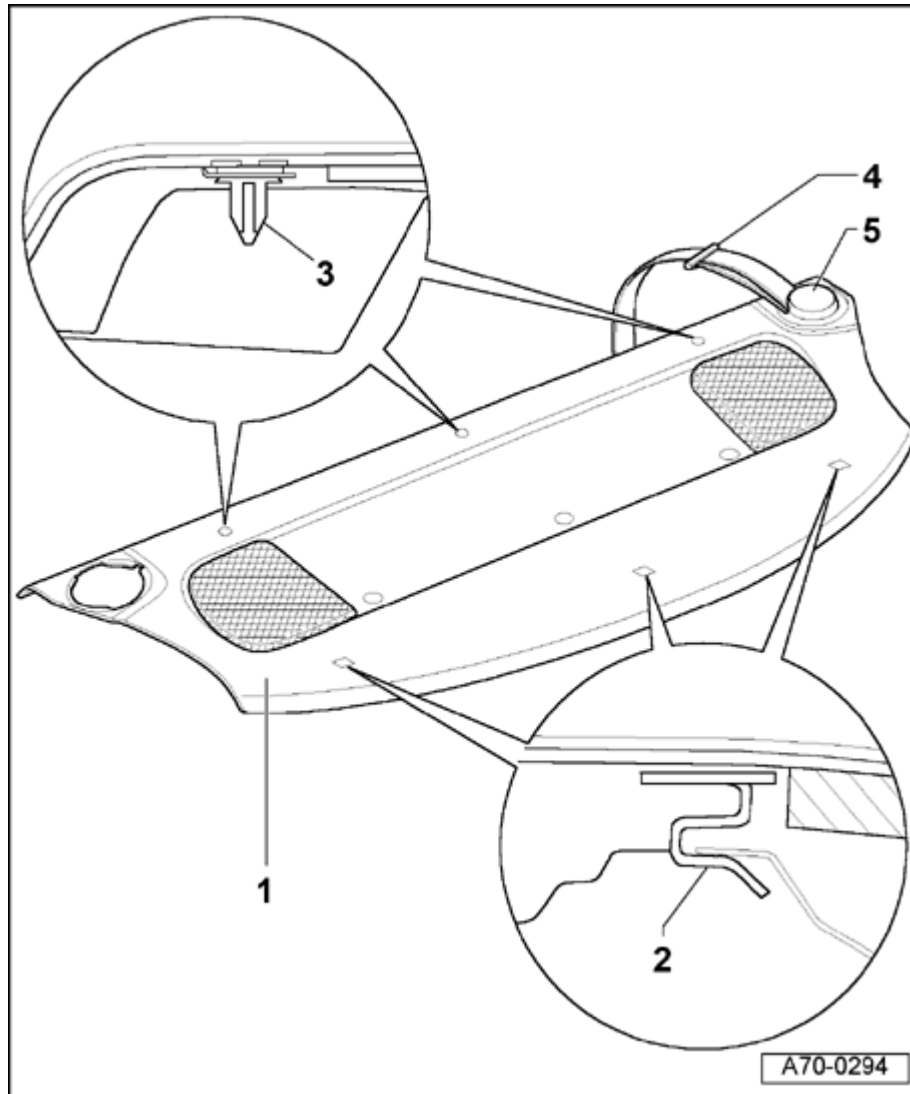
- Remove warning triangle.
- Remove bolts -1- (2x).
- Remove bolts -2- (12x) (match trim color) and remove trim.



Rear panel trim, removing and installing



- Remove bolt -2- (8x).
Tightening torque: 2 Nm (18 in. lb)
- Remove rear panel trim -1- up and out.



Rear shelf (Sedan), removing and installing

1 - Rear shelf

Removing:

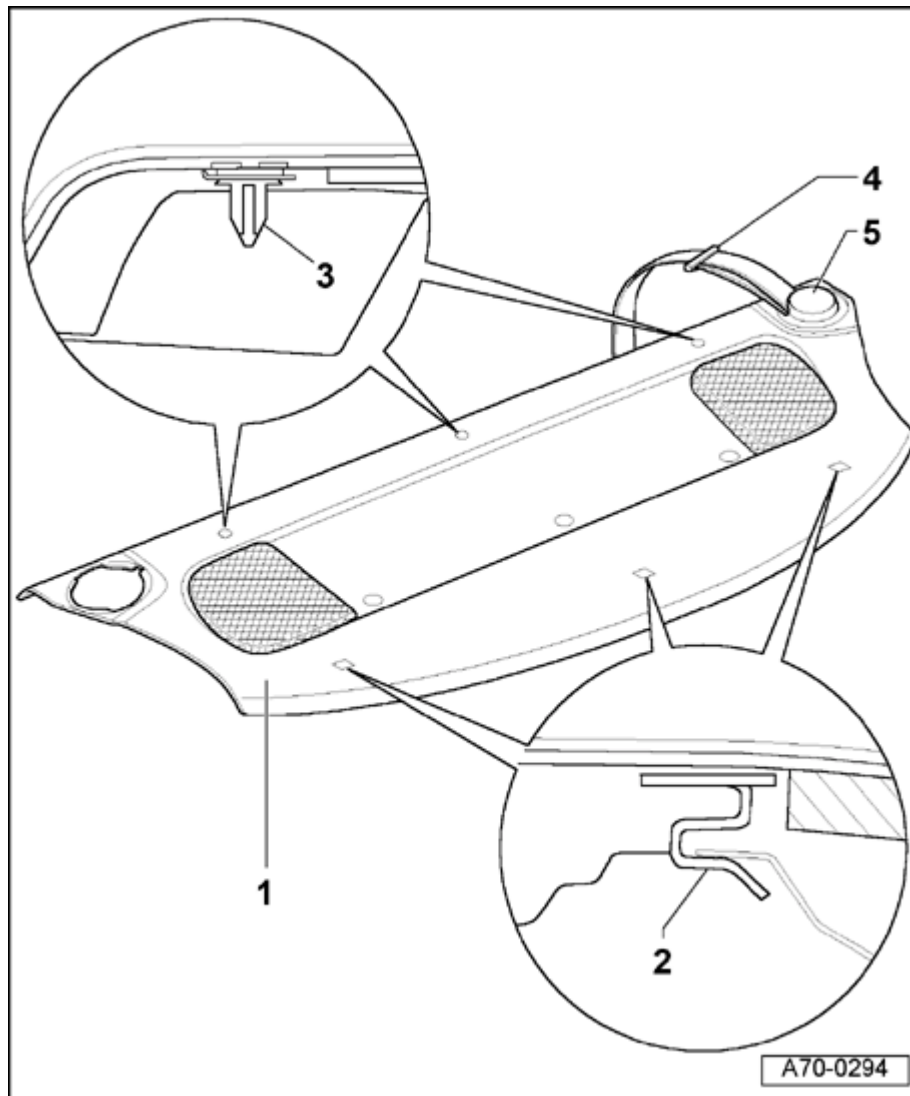
- Remove left and right-rear lower seat belt mounting ⇒ [page 69-15](#) .
- Remove left and right-rear side cover ⇒ [page 72-75](#) .
- Unclip cover -5- and guide -4- of left and right-rear three-point seat belts ⇒ [page 70-85](#) .
- For vehicles with third brake light, disconnect harness connector to third brake light in trunk.
- Unclip clips -3- (3x) by carefully lifting rear shelf.
- Pull rear shelf forward and remove.

Installing:

- When installing, slide rear shelf -1- in while pressing down slightly until clips -3- (3x) engage.
- Engage clips -3- (3x).

◆ Rest of installation is reverse of removal

70-84

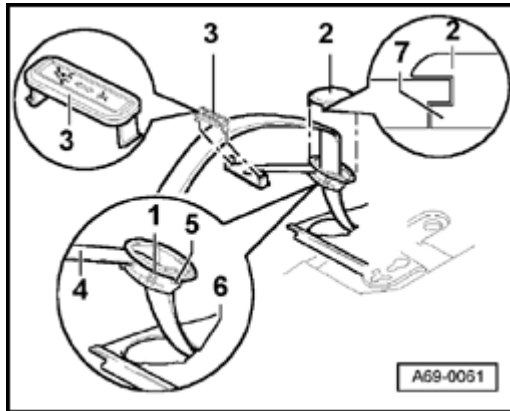
**2 - Clips (3x)****3 - Clips (3x)****4 - Guide****5 - Cover**

Rear belt adjuster, removing and installing

Removing

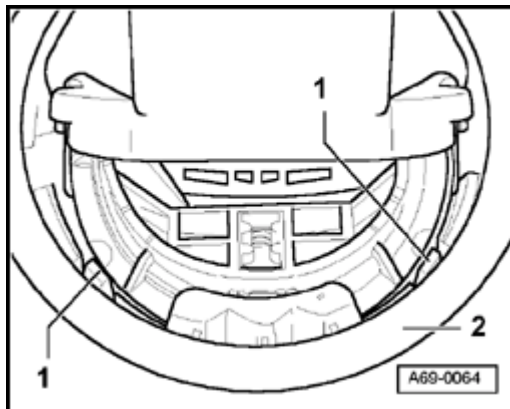
Note:

It is not necessary to remove the rear shelf when removing the rear belt adjuster.



A

- Undo lower anchoring point of rear three-point seat belt.
Tightening torque: 50 Nm (37 ft lb)
- Unclip belt guide cover -3-.
- Detach belt adjuster cover -2- at left and right of retaining tab -7-.
- Swing belt adjuster -4- with belt webbing upward.



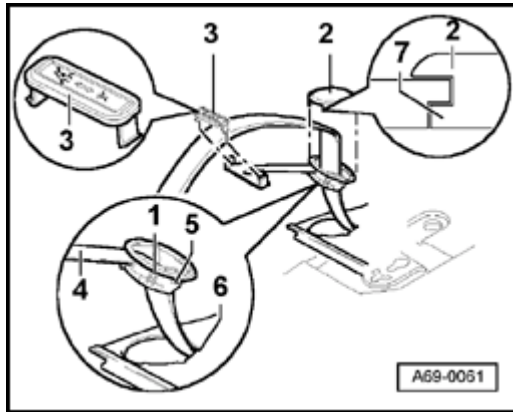
A

- Use screwdriver to press retaining tab -1- (2x) inward while simultaneously pulling up on belt adjuster -2-.
- Pull belt webbing through belt adjuster -2-.

Installing

4

- Make sure retaining tabs -1- (2x) fully engage.
 - Make sure rear lug engages in notch -6-.
- Adjustment locking device -5- must point toward center of vehicle.



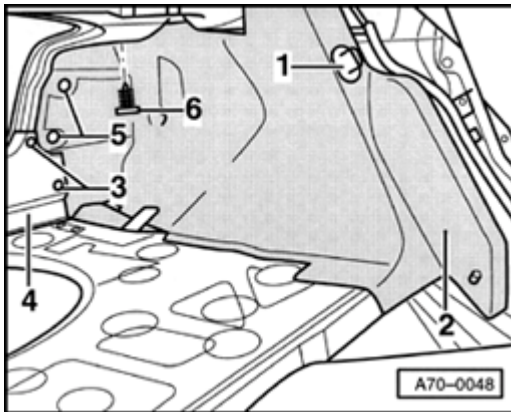
Left and right-side trunk trim, removing and installing

Foldable rear backrest

- Remove side cover ⇒ [page 72-75](#) .

Split-foldable rear seat, removing and installing
⇒ [page 72-60](#)

- Remove on-board tool kit and jack.



A

- Remove cover -1- for latch bracket and remove trim -2-.
- Remove plastic clips -5- (2x) at tail light.
- Remove screws -3- for loading edge cover -4-.
- Tightening torque: 1.5 Nm (13 in. lb)
- Unclip clip -6- at left side reinforcement.
- Raise loading edge trim -4- slightly and pull out trim -2-.
- Tilt trim toward center of vehicle and remove.

70-98

Trim (Avant)

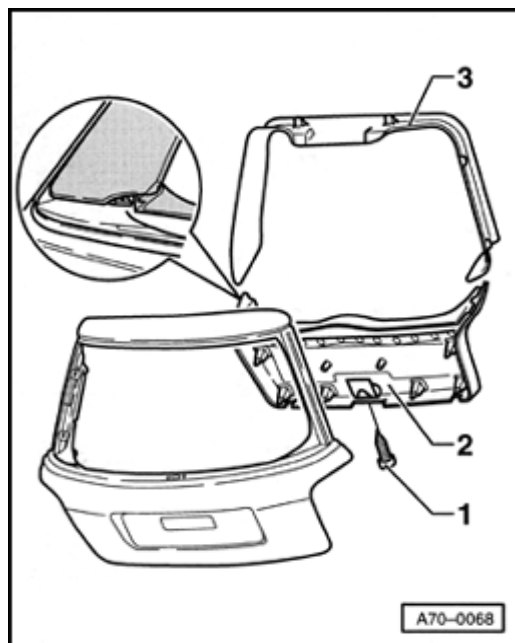
Tailgate trim, removing and installing

A

- Remove bolt -1-.
- Tightening torque: 1.2 Nm (10 in. lb)
- Unclip lower tailgate trim -2-.
- Unclip upper tailgate trim -3-.

Note:

When installing the lower trim, guide bars must be inserted in upper trim.

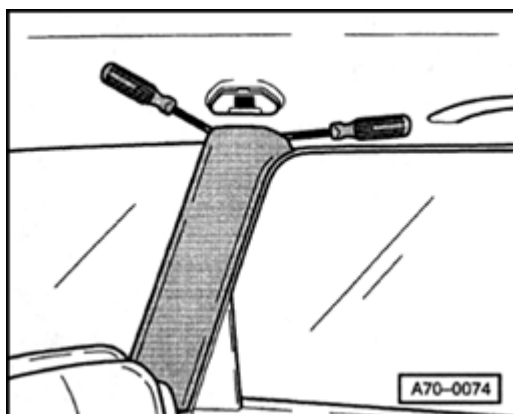


C-pillar trim, removing and installing

- Remove side panel ⇒ [page 72-75](#) .
- Remove side trim ⇒ [page 70-102](#) .
- Remove C-pillar trim using assembly hooks.

Note:

When installing, ensure retaining clips are positioned properly.

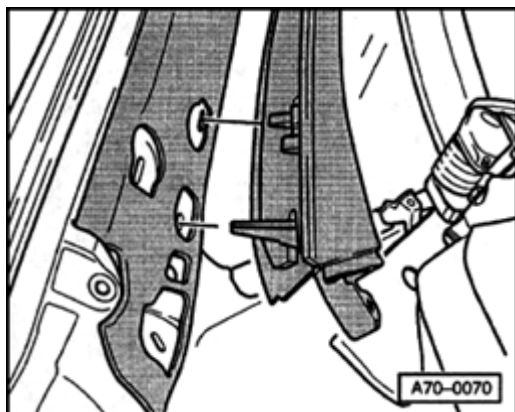


D-pillar trim, removing and installing

- Remove side panel ⇒ [page 72-75](#) .
- Remove side trim ⇒ [page 70-102](#) .

Removing

- Remove D-pillar trim (use assembly hooks for easier removal).



Installing

- Install trim at roof panel trim, guide centering drift to centering hole and position retaining clips.



- Swing D-pillar trim in direction of arrow and attach to body.

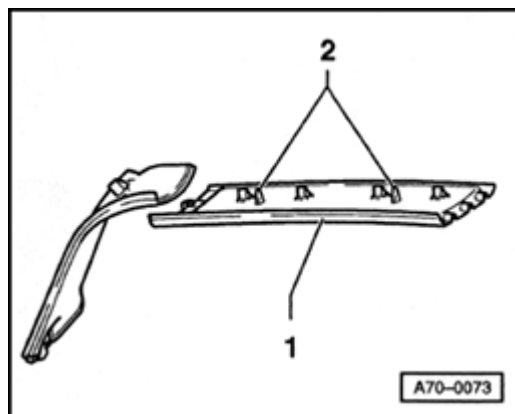
CAUTION!

- ♦ *When installing D-pillar trim, it must be inserted in roof panel trim groove.*

- ♦ *Current retaining clips are not right-angled. If clips were separated from D-pillar trim during removal, they must be repositioned at the correct angle.*

Roof panel trim, removing and installing

- Remove side panel ⇒ [page 72-75](#) .
- Remove rear panel trim ⇒ [page 70-103](#) .
- Remove side trim ⇒ [page 70-102](#) .
- Remove D-pillar trim -3- ⇒ [page 70-100](#) .
- Remove bolts (arrow) 2x and unclip trim -1- .
Tightening torque: 1.5 Nm (13 in. lb)



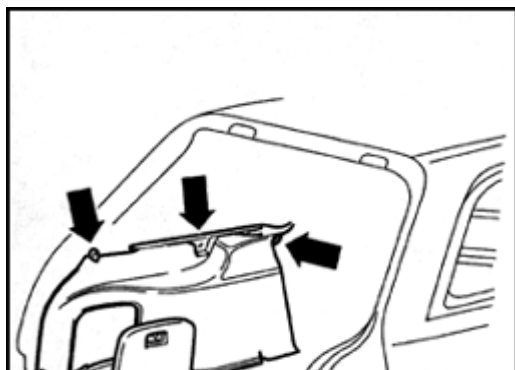
Note:

To install, insert centering drifts in locating holes -2- and correctly position retaining clips.

Left and right-side trim, removing and installing

- Remove side panel ⇒ [page 72-75](#) .
- Remove tailgate seal in area of loading edge/side panels.
- Remove loading edge ⇒ [page 70-103](#) .
- Lift front edge of cover for seat belts and unclip.
- Lift up cover for latch bracket for rear backrest.
- Remove cap.

Disassembling tie-down ⇒ [page 70-104](#) .



4

- Remove bolts (arrow).
Tightening torque: 1.5 Nm (13 in. lb)
- Unclip side trim and pull up and over belt guide and latch bracket.
- If changing completely, disassemble seat belt webbing underneath rear seat.

Installation is the reverse of removal.

Rear panel trim, removing and installing

- Remove tailgate seal in area near trim.
- Remove bolts (2x).

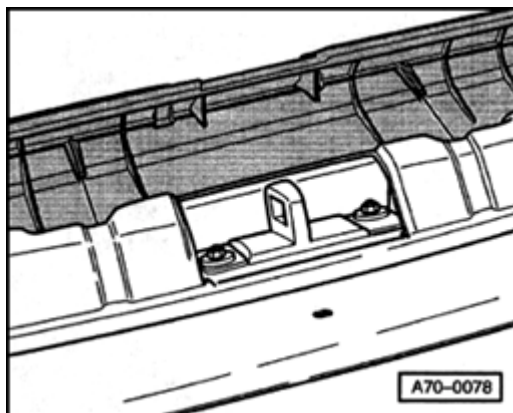
Tightening torque: 1.5 Nm (13 in. lb)

A

- Remove rear panel trim upward.

Note:

When installing, install centering drifts in locating holes and position retaining clips properly.



Tie-down (Avant), removing and installing

- Remove bolts (2x) for each tie-down.

Tightening torque: 4.5 Nm (40 in. lb)

- Remove trunk mat.
- Remove side trim ⇒ [page 70-102](#) .
- Remove trunk mat backing and brackets for front and rear tie-downs.

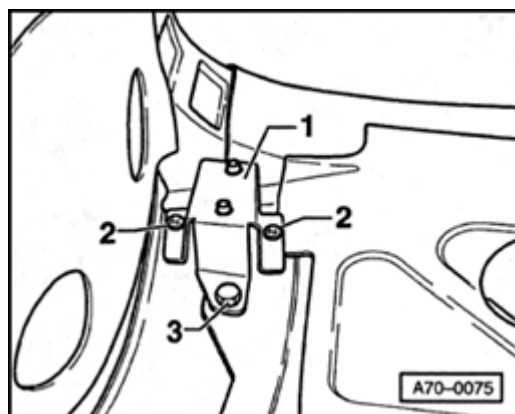
Installation is the reverse of removal



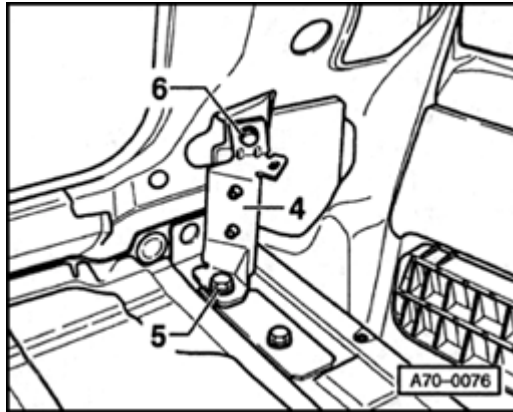
Tightening torques for front brackets:

Phillips-head screw (2x with front-wheel drive; 4x with all wheel drive):
6 Nm (53 in. lb)

Hex bolt (1x - only for front wheel drive): 30 Nm (22 ft lb)



70-105



A Tightening torques for rear brackets:

Bolt in floor: 23 Nm (17 ft lb)

Bolt in rear panel: 10 Nm (7 ft lb)

72-1

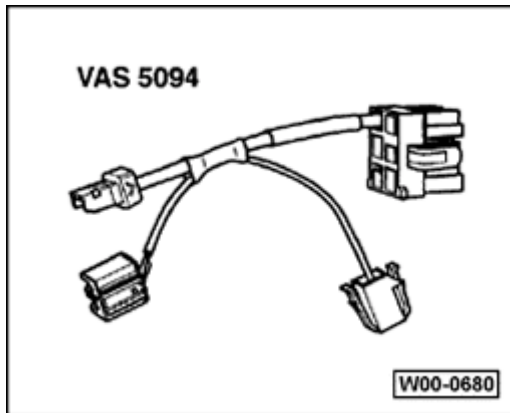
Front seats

Special tools and equipment



VAS 5094 airbag adapter

Connecting ⇒ [page 72-9](#) .



Front seats, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

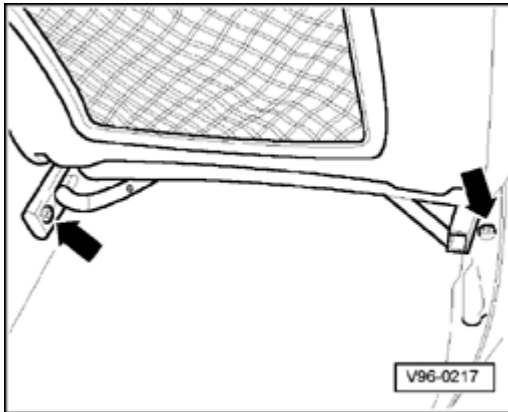
Notes:

- ◆ *Slight changes may have to be made to the removal and installation procedures, depending upon the equipment installed in vehicle.*
- ◆ *For memory and power seats, move seat fully up and back before disconnecting the battery.*
- ◆ *Before disconnecting the battery, determine the radio code.*

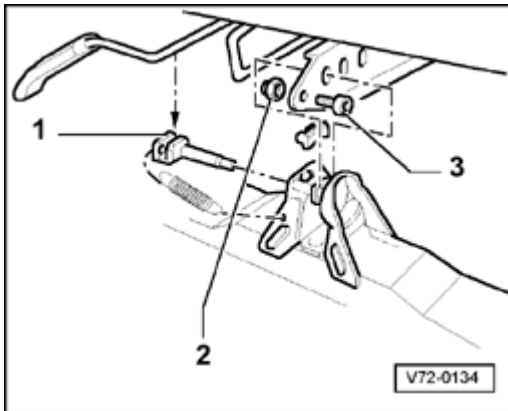
WARNING!

**Before removing seat, disconnect battery
Ground (GND) strap.**

- Push seat forward.

**A**

- Remove cap (right arrow) and remove Phillips-head screw located under cap.
- Remove screw (left arrow) and remove stopper toward rear.

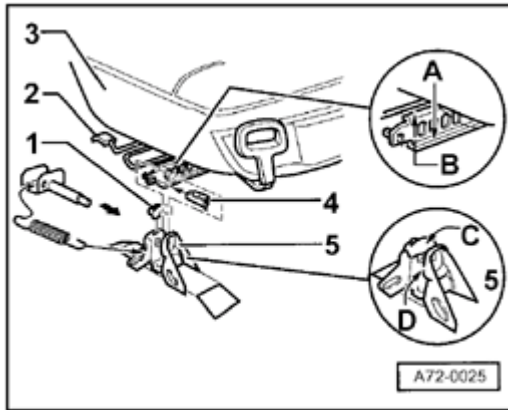
**A**

- Remove cap nut -2- and socket-head screw -3-.
- Tightening torque: 8 Nm (71 ft lb)
- Release retaining rod -1- and pull seat toward rear out of guide rails.

Note:

The attachment with socket-head screw -3- is replaced by a stop spring as a running change.

72-4



4

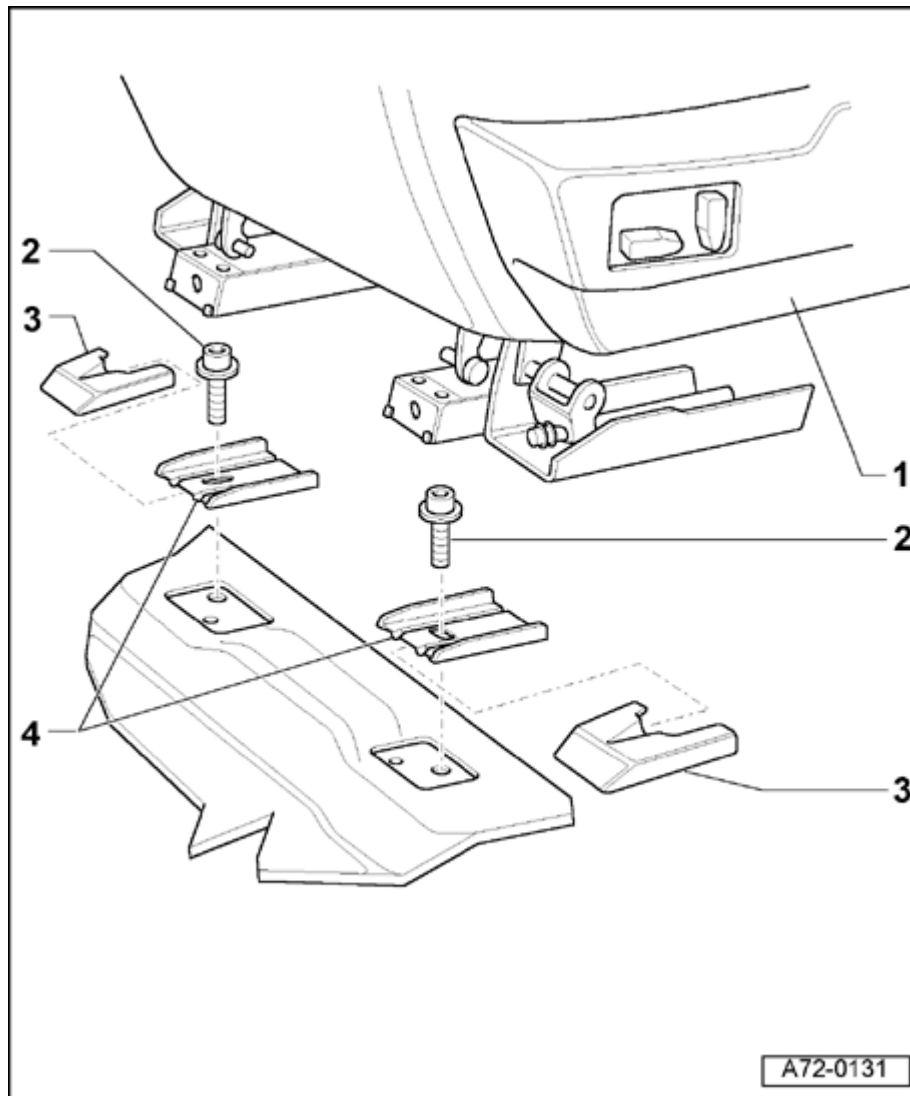
- Unclip stop spring -4-.
- Pull release lever up and push out seat -3- to rear.

Note:

For vehicles with heated seats, disconnect the harness connector.

CAUTION!

When sliding seat out of guide rails, ensure that carpeting is not ripped.



Front power seats, removing and installing

WARNING!

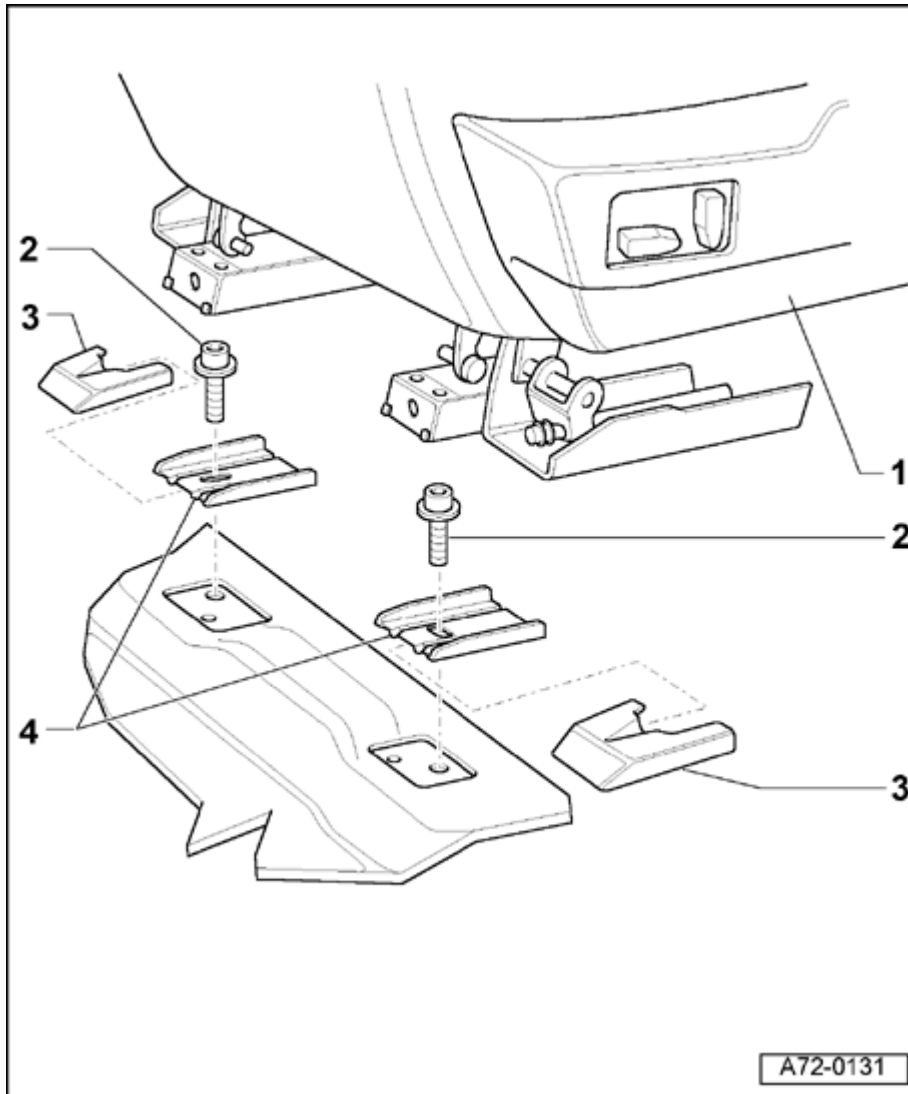
Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#).

Notes:

- ◆ Slight changes may have to be made to removal and installation procedures, depending upon equipment installed in vehicle.
- ◆ For power seat, move seat fully up and back before disconnecting battery.
- ◆ Before disconnecting battery, determine radio code.

WARNING!

Disconnect battery Ground (GND) strap before removing seat.



1 - Front seat

Removing:

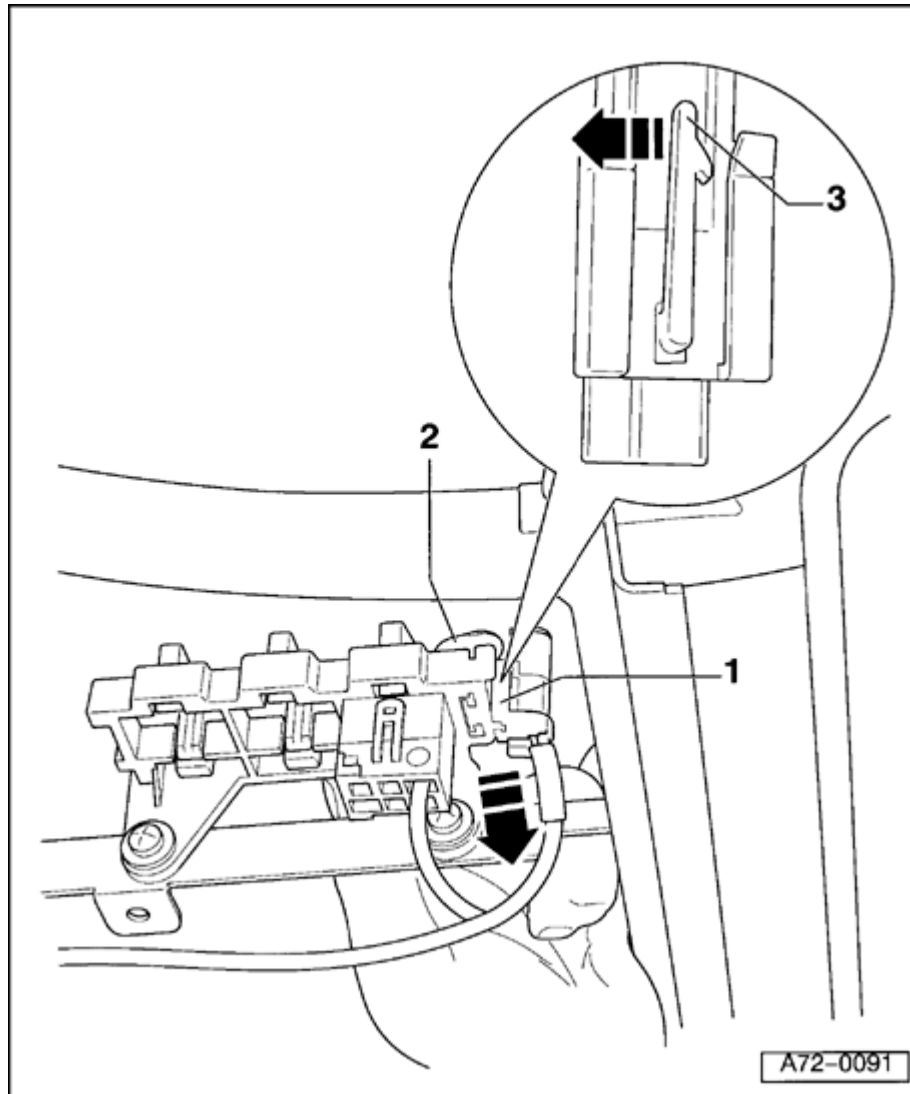
- Remove left and right caps -3- by pushing down, then pulling toward front of vehicle.
- Remove bolts -2-.
- Carefully remove front seat -1- from vehicle.

2 - Bolts

◆ 25 Nm (18 ft lb)

3 - Caps

4 - Seat rail



Side airbag harness connector, disconnecting

WARNING!

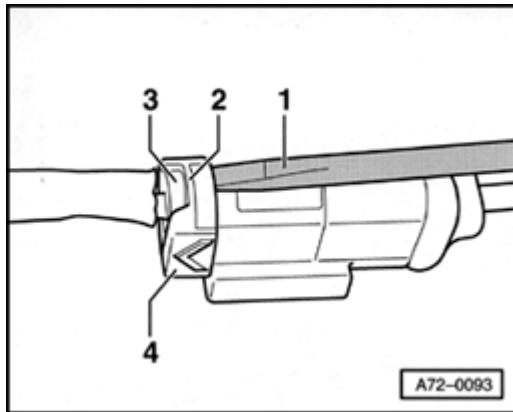
Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#).

Note:

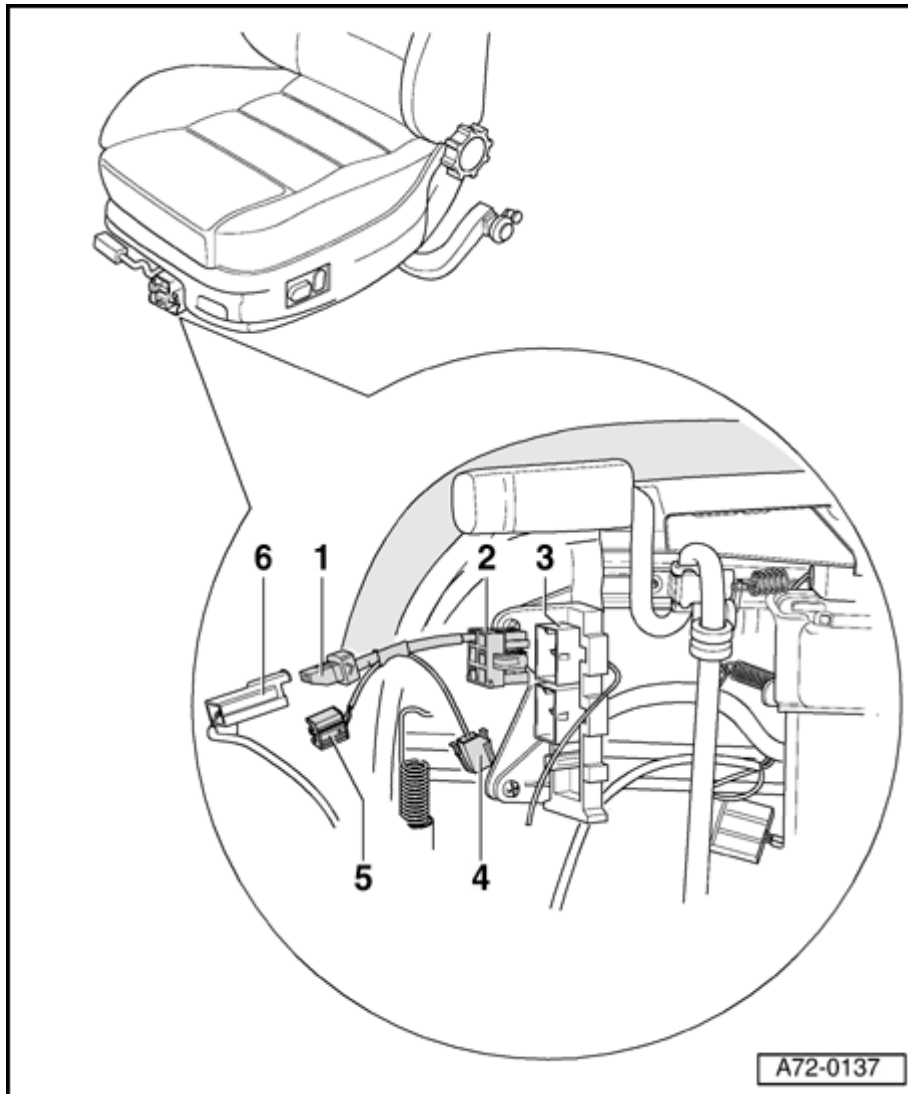
Technician must be grounded before disconnecting ignition and Ground (GND) wiring; to ensure proper grounding, touch door striker or body.

- Grab side airbag harness connector -1- from behind.
- Pull catch -3- with one finger in direction of arrow (toward hand).
- At same time, use same hand to pull side airbag connector -1- forward (in direction of arrow).

72-8



- Using screwdriver -1-, push tab -2- over catch -3- and disconnect harness connector -4-.



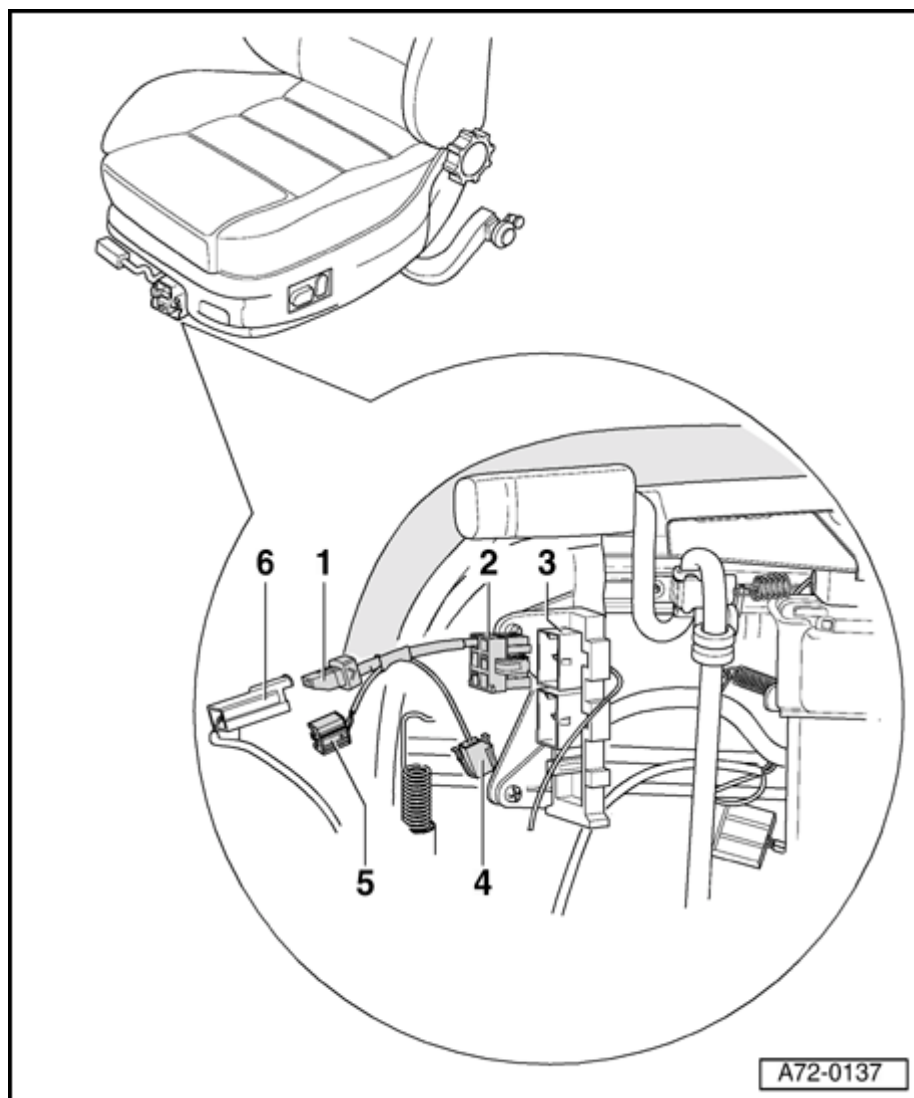
VAS 5094 airbag adapter, connecting

- Insert harness connector -2- ((VAS 5094 airbag adapter) into connector housing -3-.
- Connect igniter wire -6- from airbag module (on seat frame) to harness connector -1- (airbag adapter).
- For seats with seat heaters, disconnect harness connector.
- Turn down carpet in area near guide rail.
- Push seat back out of guide rail.
- Lift seat out of vehicle.

WARNING!

Leave VAS 5094 airbag adapter on seat until seat is again installed in vehicle.

72-10



1 - Airbag adapter-igniter wire harness connector

2 - Airbag adapter - Ground wire harness connector

◆ Audi A6, 1998 ➤

◆ Audi A4, 1995 ➤

◆ Audi A3, 1997 ➤

3 - Ground wire harness connector from airbag module

4 - Airbag adapter - Ground wire harness connector

◆ Golf, 1991 ➤

5 - Airbag adapter - Ground wire harness connector

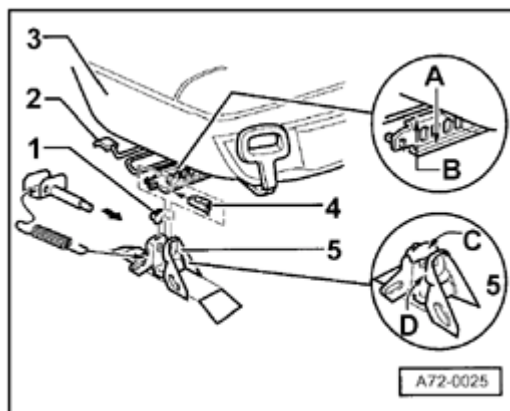
◆ Passat, 1997 ➤

6 - Airbag module igniter wire harness connector

◆ From airbag module on seat frame

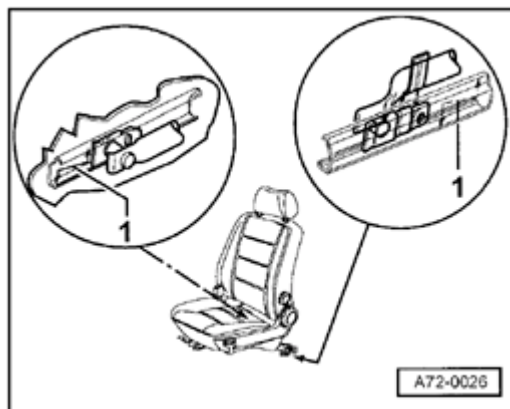
72-11

Front seat lubrication locations



A

- Lubricate lubrication positions -A-, -B-, -C-, and -D- using G 052 745 A3 universal low temperature grease.



A

- Lubricate seat guide rails at locations -1- and at side using thin layer of G 052 745 A3 universal low temperature grease.

Notes:

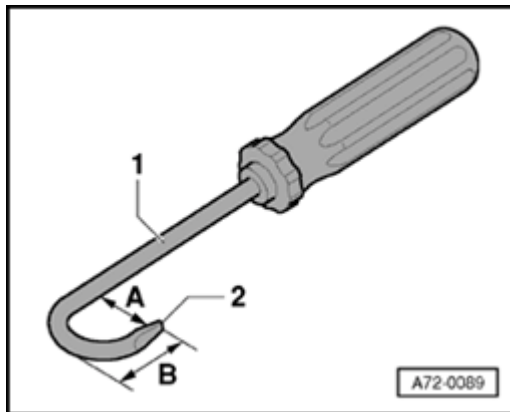
- ◆ When lubricating, make sure no grease gets on the carpet or seats.
- ◆ Only apply a thin layer of grease.

Backrest, removing and installing

WARNING!

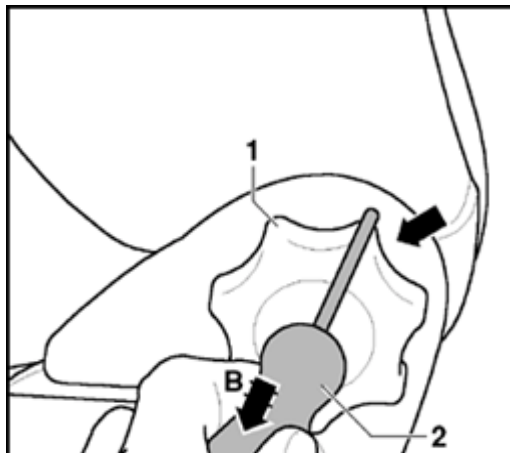
Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

Fabricating removal tool:



A

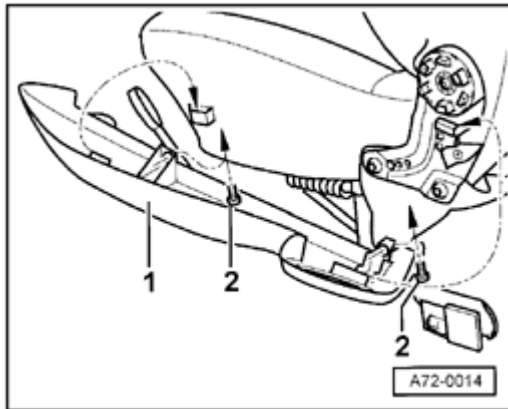
- Bend screwdriver -1- with width -2- (3.5 mm) and dimensions -A- (20 mm) and -B- (max. 15 mm).
- Remove seat ⇒ [page 72-2](#) .



A

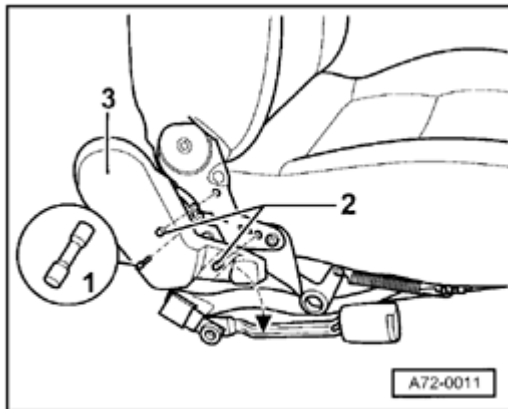
- Turn adjusting wheel -1- from behind until you can see one of the adjusting wheel catches (direction of arrow A). If necessary, use flashlight.
- Attach removal tool -2- and pull in direction of arrow -B-.
- Turn adjusting wheel an additional 120° .
- Attach removal tool -2- and pull in direction of arrow B.
- Remove adjusting wheel.

72-13



A

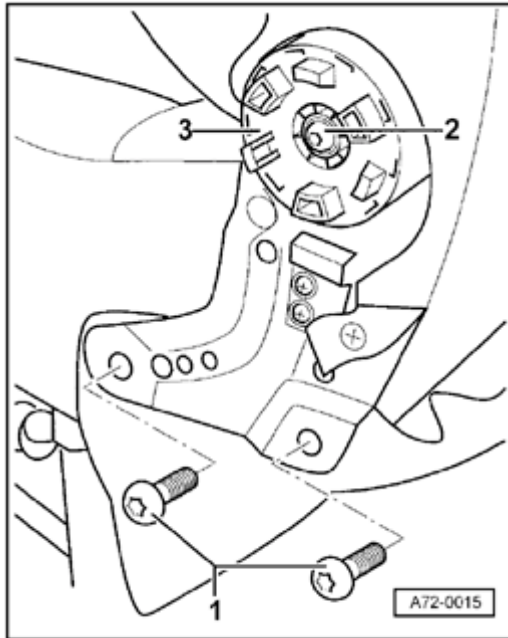
- Remove bolts -2- (2x).
- Pull bottom of trim piece -1- out slightly and detach upward out of front and rear brackets.



A

- Move belt buckle forward.
- Push through pins -2- (2x) toward inside.
- Push pin -1- in to first detent.
- Remove trim piece -3-.

72-14



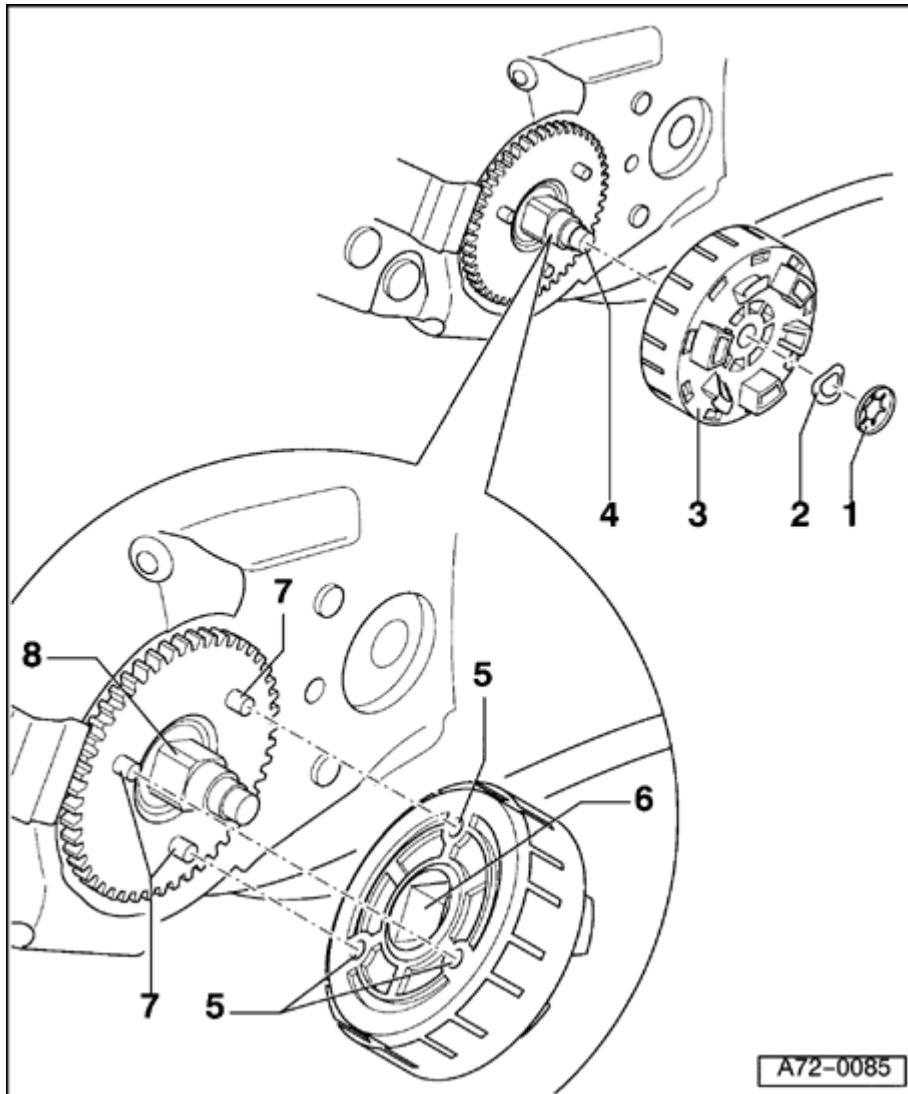
- For vehicles with seat heaters, disconnect harness connector under seat and detach from brackets.

A

- Remove bolts -1- (4x).
Tightening torque: 23 Nm (17 ft lb)
- Lift off backrest.

Note:

It is not necessary to remove brake wheel -3- because it is part of the backrest frame.



Brake element for backrest adjustment, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

1 - Spring washer

2 - Locking washer

3 - Brake element

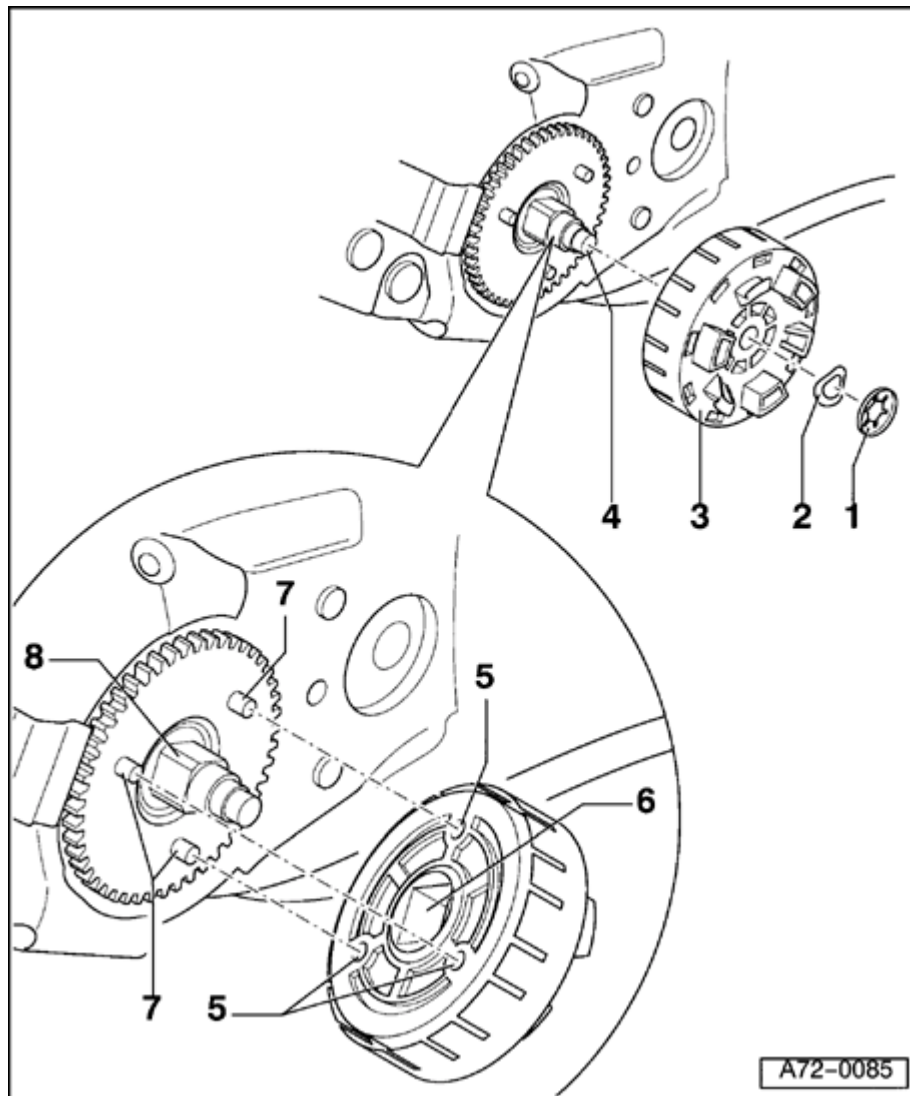
Removing:

- Remove seat ⇒ [page 72-2](#) .
- Remove side seat trim panels ⇒ [page 72-17](#) .
- Using screwdriver, remove spring washer -1-.
- Remove brake element -3- together with locking washer -2- from groove -4-.

Installing:

- When installing, insert catches -7- in mounting -5-, and square -8- in square mounting -6-.
- Tap on new spring washer -1- using socket.

72-16

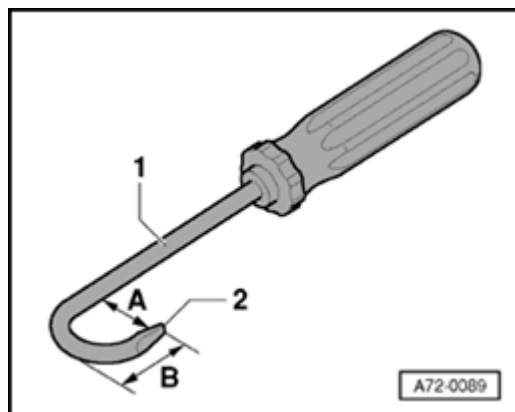


- 4 - Groove
- 5 - Mountings
- 6 - Square mounting
- 7 - Catches
- 8 - Square

Side seat trim panels, removing and installing

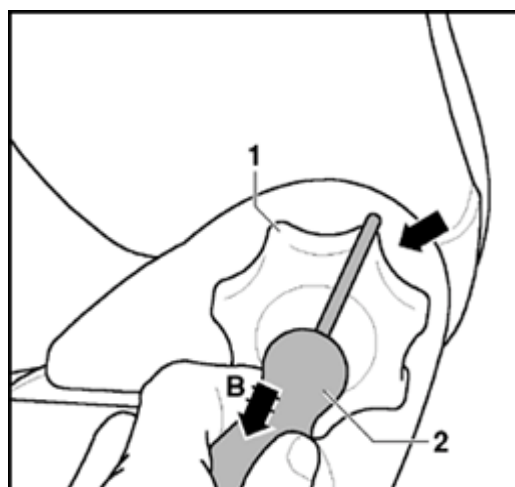
WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .



A

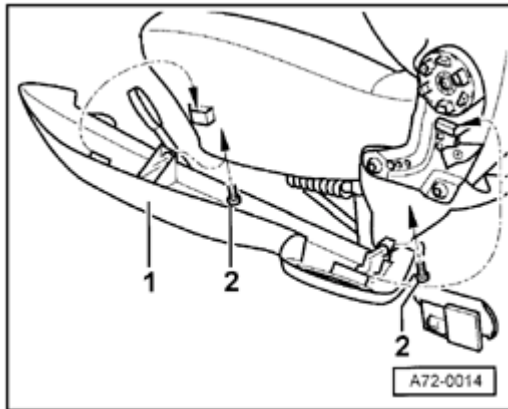
- Fabricating removal tool: Bend screwdriver -1- with width -2- (3.5 mm) and dimensions -A- (20 mm) and -B- (max. 15 mm).
- Remove seat ⇒ [page 72-2](#) .



A

- Turn adjusting wheel -1- from behind until you can see one of the adjusting wheel catches (direction of arrow -A-). If necessary, use flashlight.
- Attach removal tool -2- and pull in direction of arrow -B-.
- Turn adjusting wheel an additional 120° .
- Attach removal tool -2- and pull in direction of arrow -B-.
- Remove adjusting wheel.

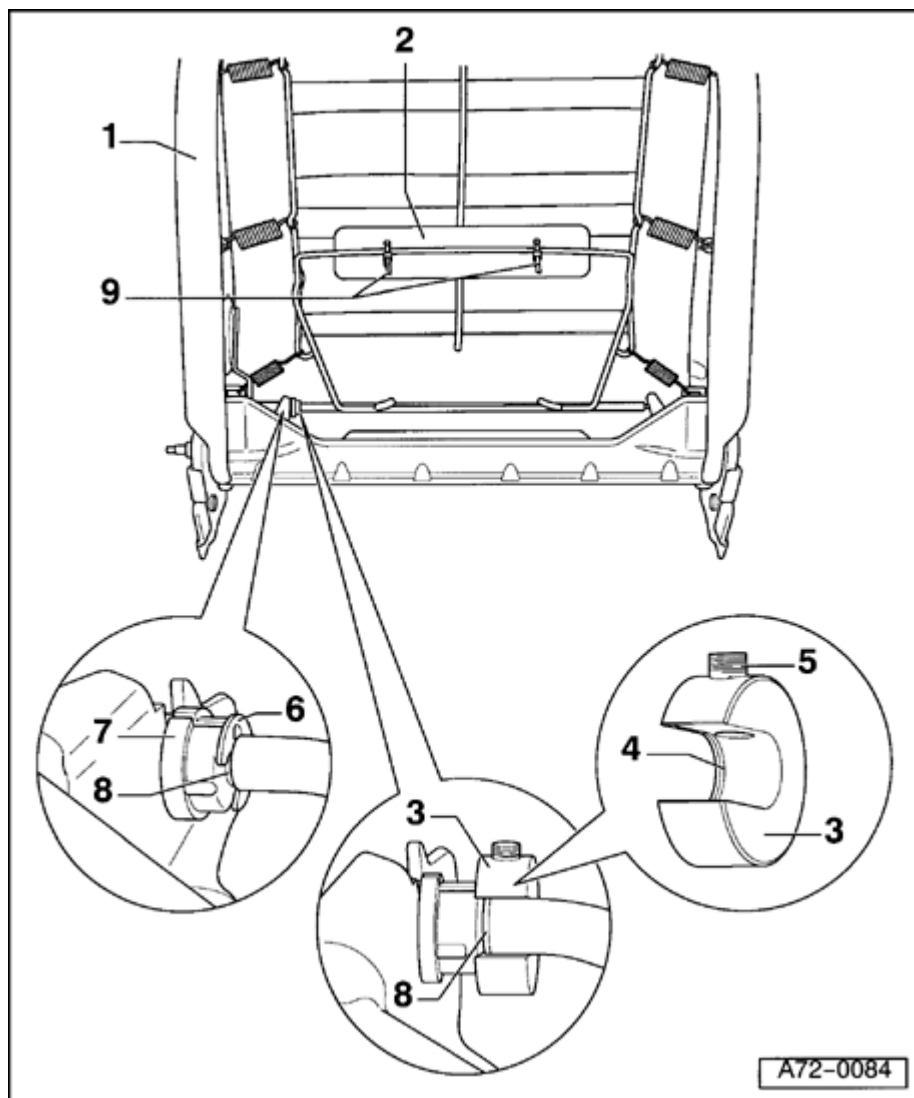
72-18



A

- Remove bolts -2- (2x).
- Pull bottom of trim piece -1- out slightly and detach upward out of front and rear brackets.

72-19



Changing lumbar support and retrofitting plastic insert

Notes:

- ◆ If the lumbar shaft is defective, the circlip can be replaced by a grip support.
- ◆ A plastic insert can be installed by pressing the lumbar support through the upholstery.

1 - Backrest frame

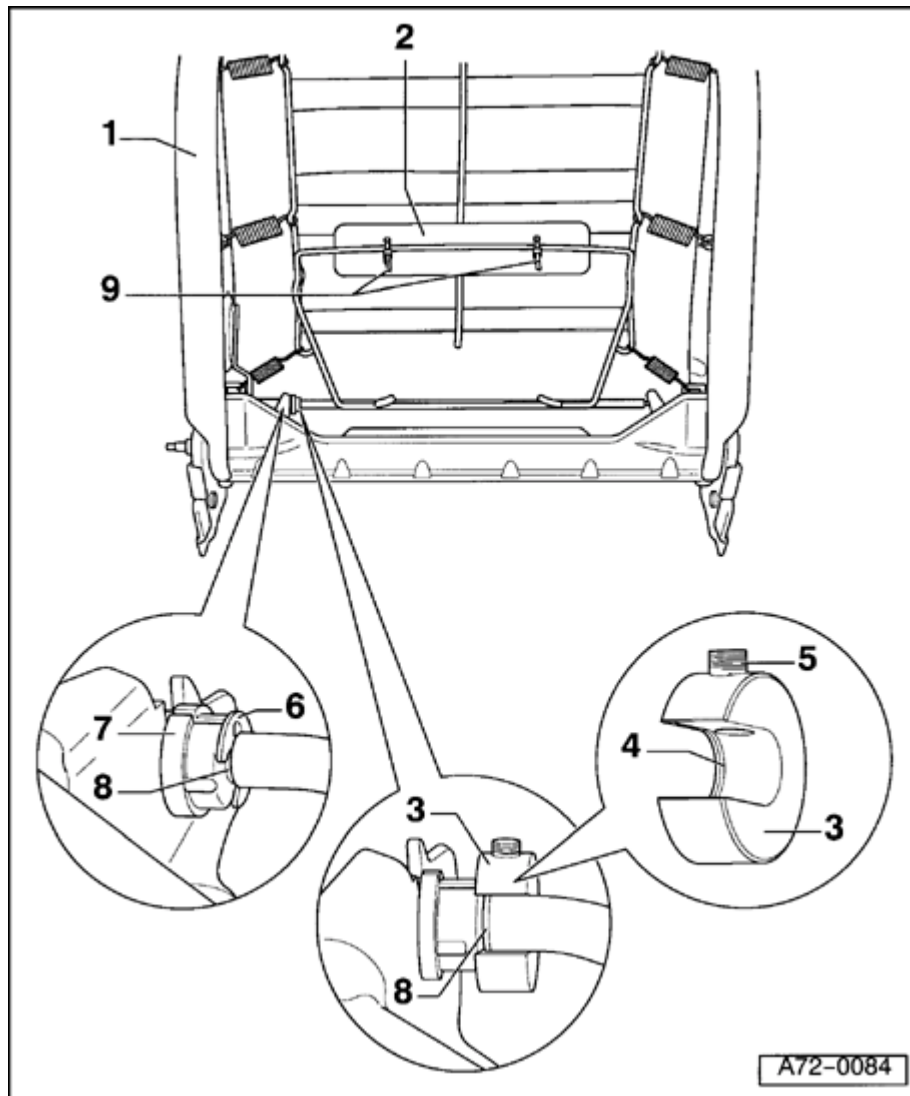
2 - Plastic insert

- Remove backrest cover ⇒ [page 74-1](#) .
- Slide plastic insert between lumbar support and spring wire.
- Secure plastic insert using two tie wraps.

3 - Grip support

- Remove backrest cover ⇒ [page 74-1](#) .
- Remove circlip -6-.
- Push bearing sleeve toward outside and install grip support -3- together with retaining flange -4- into groove -8-.
- Install set screw.

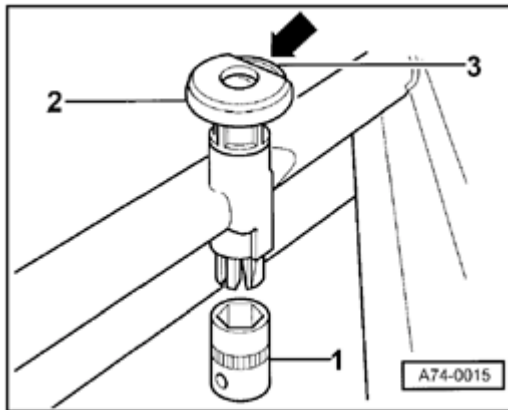
72-20

**4 - Retaining flange****5 - Set screw****6 - Circlip****7 - Bearing sleeve****8 - Groove****9 - Tie wraps (2x)**

72-21

Headrest, removing and installing

Backrest is shown without cover and padding in illustration.

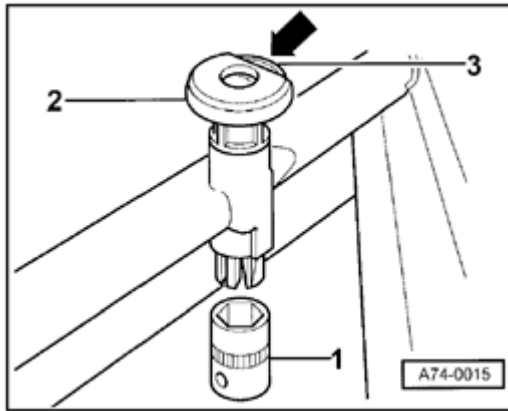


A

- Push button -3- in direction of arrow and pull headrest up and off.

Headrest guides, removing and installing (through m.y. 1999)

◆ Backrest cover, removing and installing ⇒ [page 74-1](#).



A

- Using 17mm socket, push headrest guide up and out.
- When installing headrest guide, ensure guide lugs are positioned correctly. Side of guide lugs always face toward outside.
- Headrest guide with button -3- is only located on one side of backrest.

Headrest guides, removing and installing (from m.y. 2000)

- ◆ Backrest cover, removing and installing ⇒ [page 74-1](#).

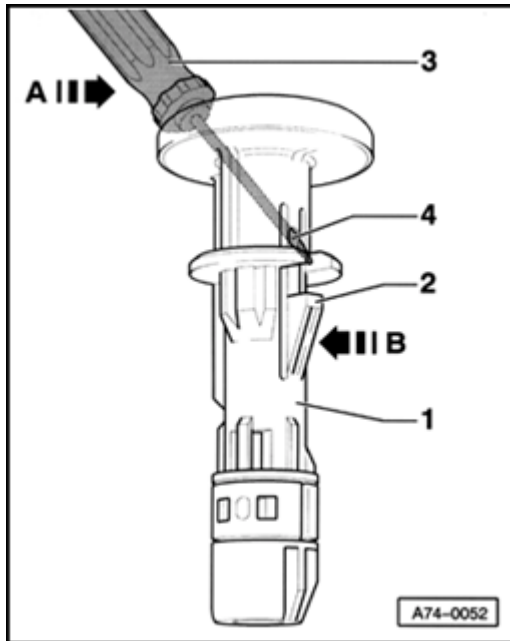
**A**

Fig. 1 Removing head restraint guides

For greater clarity, head restraint guide -1- is shown removed.

- Insert upholstery needle or screwdriver -3- with maximum width of 2 mm into hole -4- (opposite retaining clip for head restraint guide).
- Pry screwdriver -3- in direction of arrow -A-, press retainer tab -2- in direction of arrow -B- and pull out head restraint guide -1-.

72-24

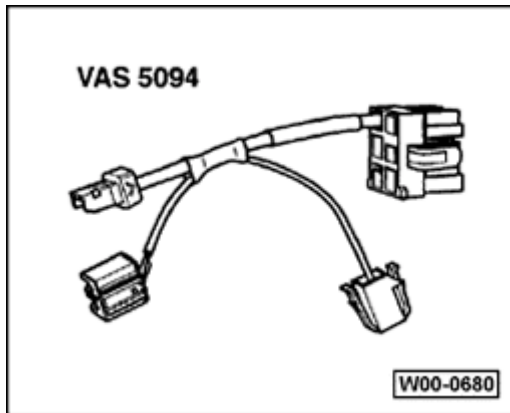
Recaro seat

Special tools and equipment



VAS5094 airbag adapter

Connecting ⇒ [page 72-9](#) .



Recaro seat, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

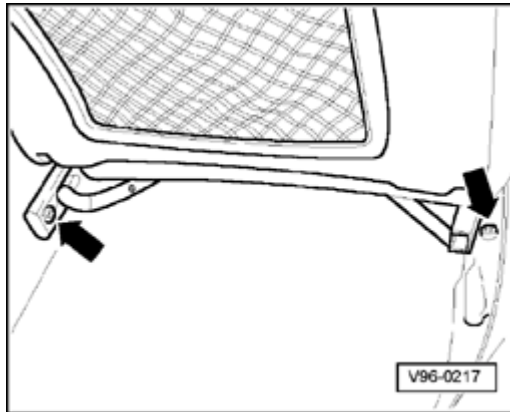
Notes:

- ◆ *Slight changes may have to be made to removal and installation procedures, depending upon equipment installed in vehicle.*
- ◆ *For memory and power seats, move seat fully up and back before disconnecting the battery.*
- ◆ *Before disconnecting the battery, determine the radio code.*

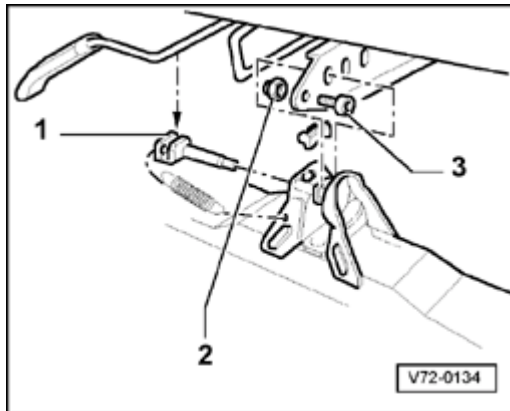
WARNING!

Disconnect battery Ground (GND) strap before removing seat.

- Push seat forward.

**A**

- Remove cap (right arrow) and remove Phillips-head screw located under cap.
- Remove screw (left arrow) and remove stopper toward rear.

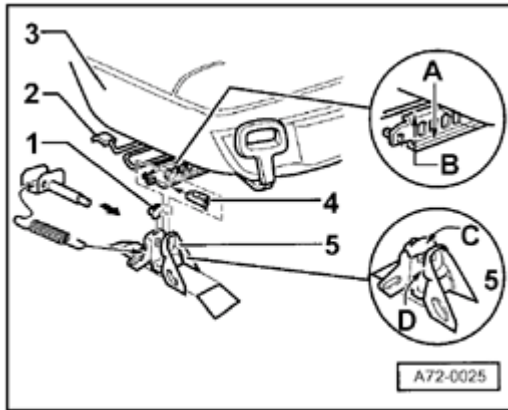
**A**

- Remove cap nut -2- and socket-head screw -3-.
- Tightening torque: 8 Nm (71 in. lb)
- Release retaining rod -1- and pull seat toward rear out of guide rails.

Note:

The attachment with socket-head screw -3- is replaced by a stop spring as a running change.

72-27



4

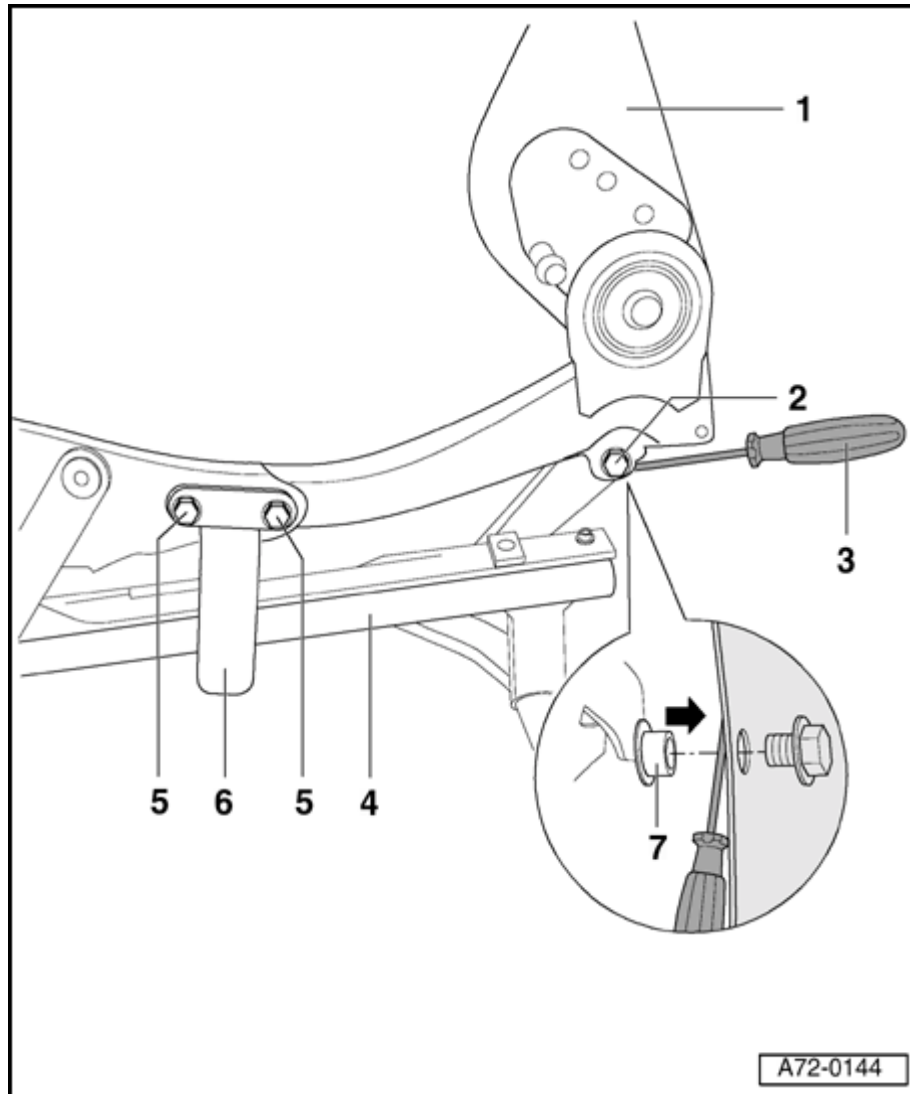
- Unclip stop spring -4-.
- Pull release lever up and push out seat -3- to rear.

Note:

For vehicles with heated seats, disconnect the harness connector.

CAUTION!

When sliding seat out of guide rails, ensure that the carpet is not ripped.



Backrest, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

Note:

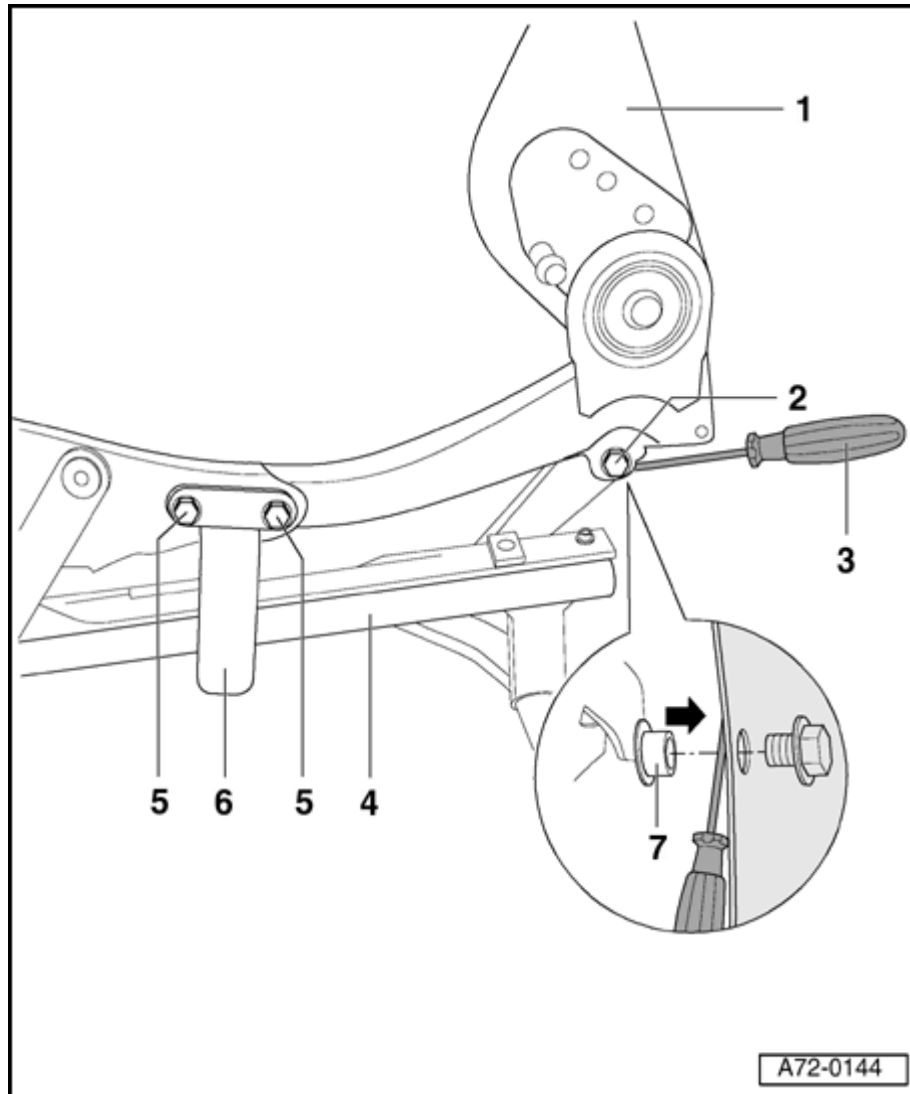
Seat is shown without upholstery and from the door sill side in illustration.

1 - Backrest frame

Removing:

- Remove seat ⇒ [page 72-25](#) .
- Remove side seat trim panels ⇒ [page 72-36](#) .
- Remove seat cushion ⇒ [page 72-32](#) .
- Disconnect harness connector to backrest heater element ⇒ [page 74-29](#) .
- Disconnect purple/yellow side airbag harness connector ⇒ [page 69-81](#) .
- Remove bolts -2- (2x).
- Remove bolts -5- (4x).
- Using screwdriver -3-, detach backrest frame -1- at securing points.

72-29



Installing:

Note:

Always replace bolts -2- and -5-.

- Install bushing -7- on both sides of rear securing points of backrest so collar faces toward inside.
- Slide backrest frame -1- from rear into seat frame -4-.
- Install bolts -2- and -5-, but do not tighten.
- Tighten bolts -2- and -5-.

2 - Bolts (2x)

- ◆ 23 Nm (17 ft lb)

3 - Screwdriver

4 - Seat frame

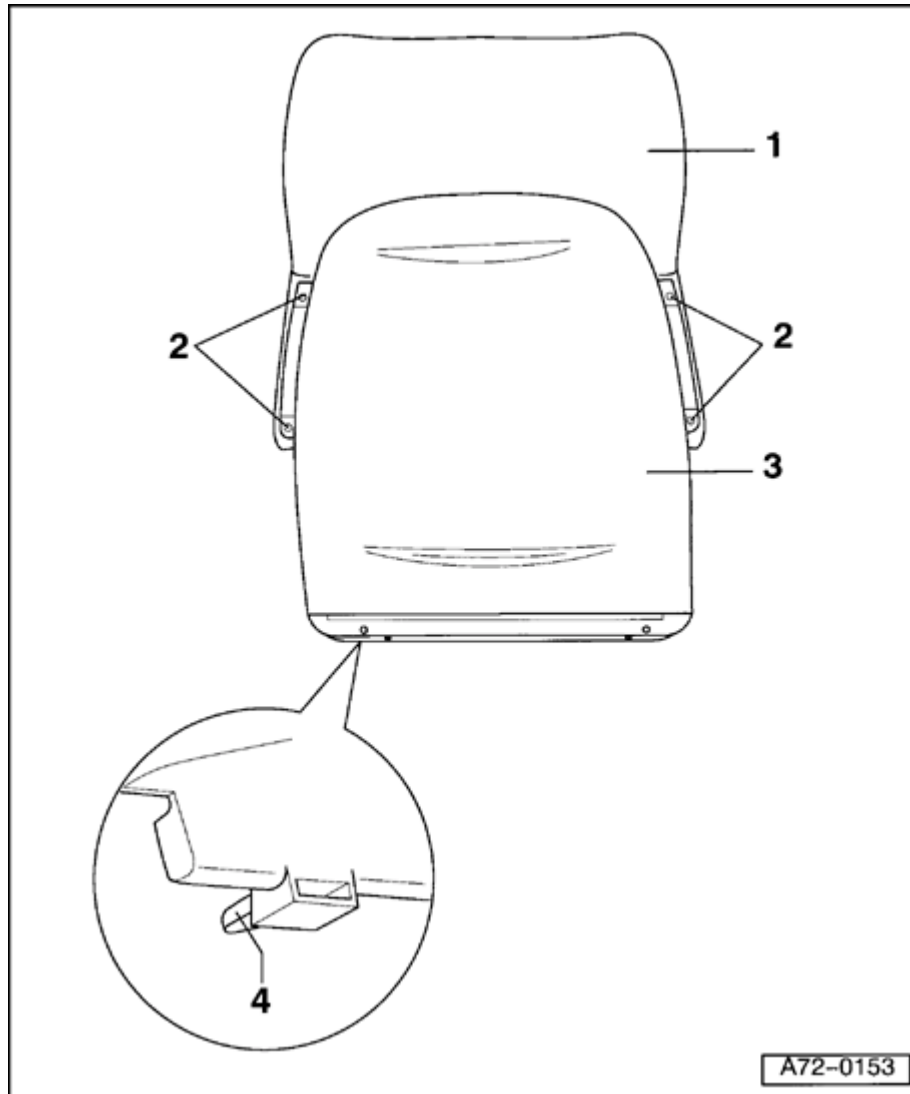
5 - Bolts(4x)

- ◆ 23 Nm (17 ft lb)
- ◆ Door sill side longer than tunnel side

6 - Bracket

- ◆ Only on door sill side

7 - Bushings (2x)



Backrest shell, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

1 - Backrest

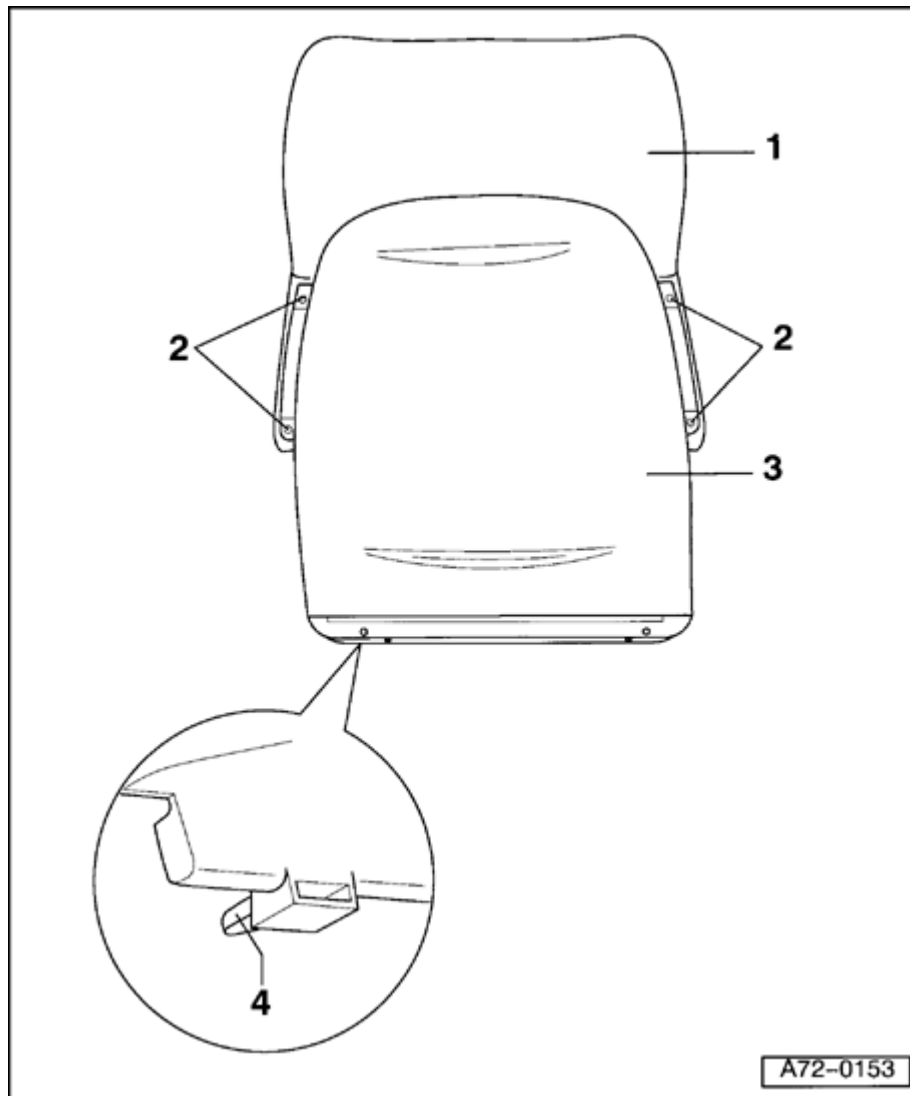
1 - Bolts (4x)

2 - Backrest shell

Removing:

- Move seat fully up.
- Remove seat ⇒ [page 72-25](#) .
- Remove trim panels ⇒ [page 72-41](#) .
- Remove side airbag module ⇒ [page 69-81](#) .
- Remove backrest upholstery ⇒ [page 74-22](#) .
- Remove spring cover ⇒ [page 72-43](#) .
- Unbolt bolts -2- (4x) on side of backrest shell -3-.
- Place seat so backrest shell -3- is accessible from below.
- Push both clips -4- on bottom of backrest shell -3- slightly toward each other.

72-31

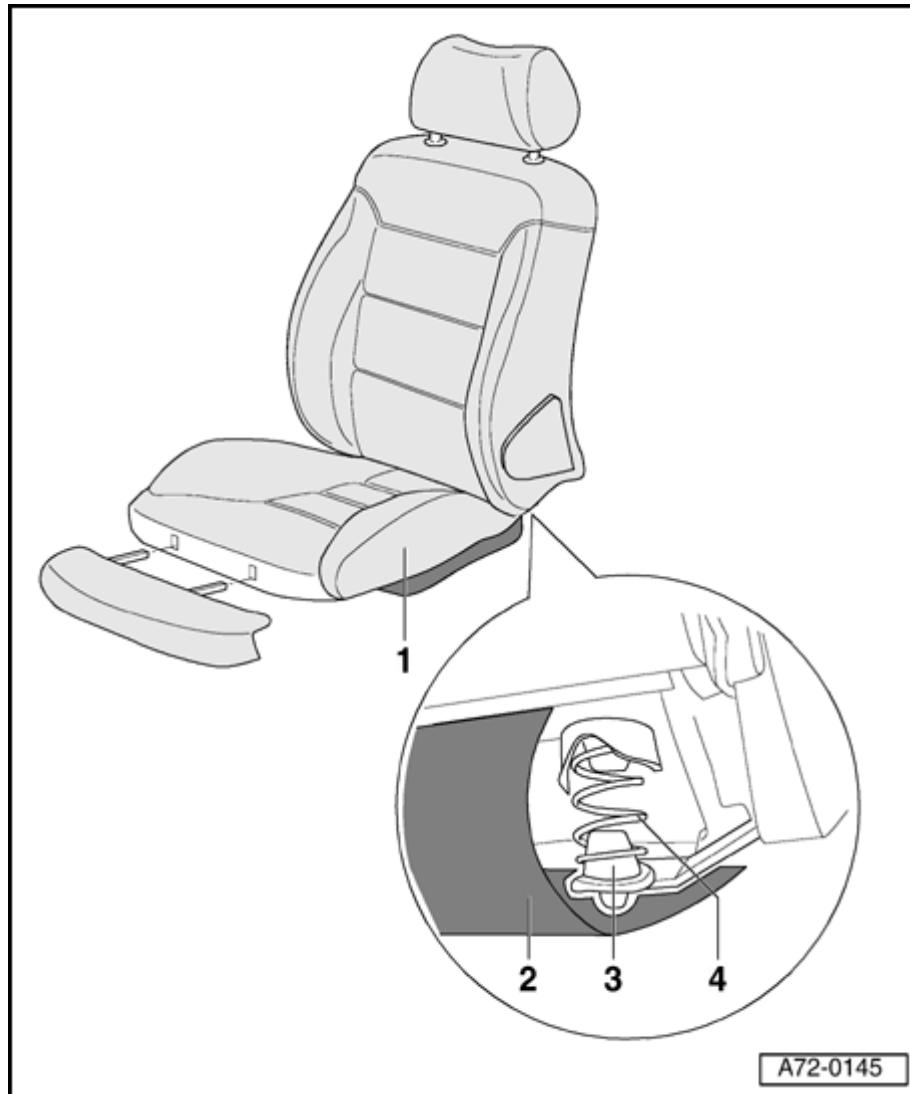


- Detach backrest shell from seat -3- from below.
- Remove backrest shell -3- up and out.

Installing:

- Attach backrest shell -3- at upper part of backrest -1-.
- Push backrest shell -3- down until clips -4- engage.
- Tighten bolts -2- (4x).

3 - Clips (2x)



Seat cushion, removing and installing

WARNING!

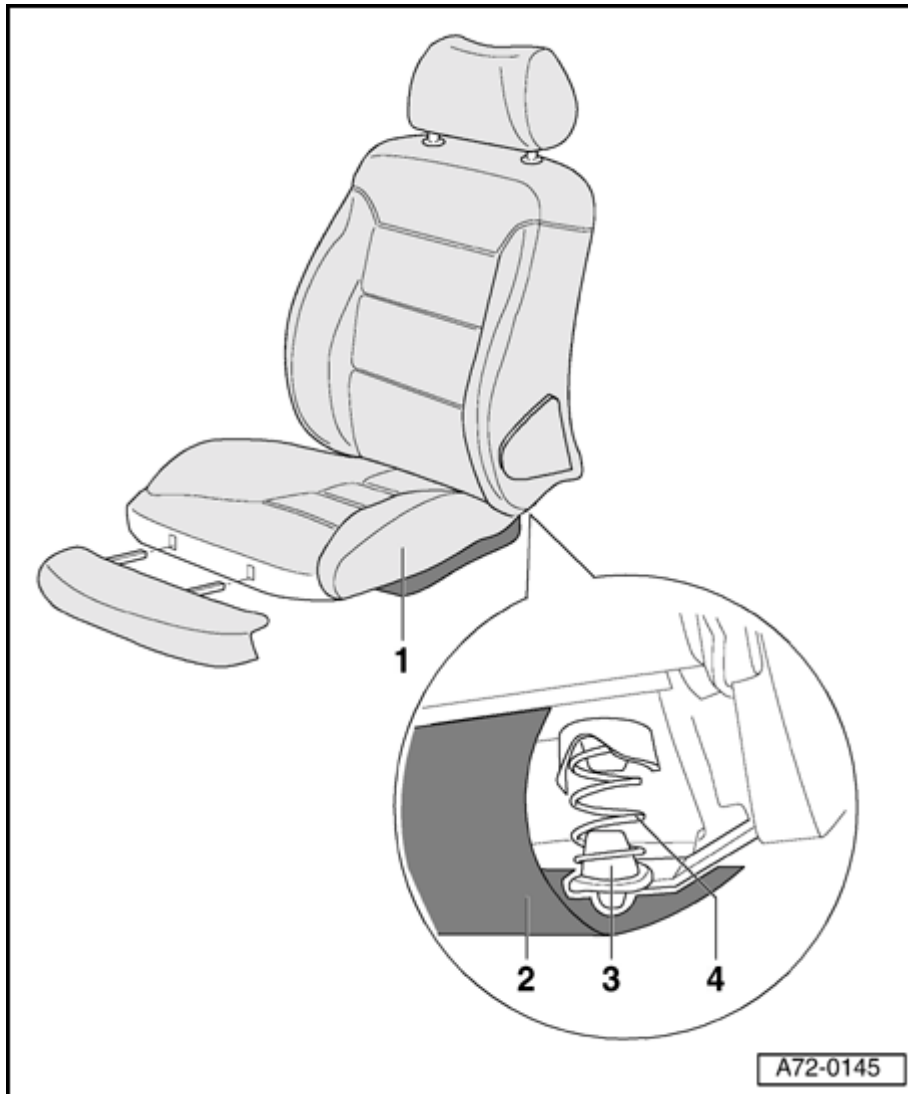
Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

1 - Seat cushion

Removing:

- Move seat fully up.
- Remove seat ⇒ [page 72-25](#) .
- Remove seat cushion extension, front cover panel and guide sleeves ⇒ [page 72-34](#) .
- Remove trim panels ⇒ [page 72-41](#) .
- Remove spring cover ⇒ [page 72-43](#) .
- Detach electrical cover -2- under seat.
- If installed, disconnect seat cushion wiring (seat heater, seat-occupied sensor).
- Push up front of seat cushion -1-.
- Remove seat cushion -1- forward and out.

72-33

**Note:**

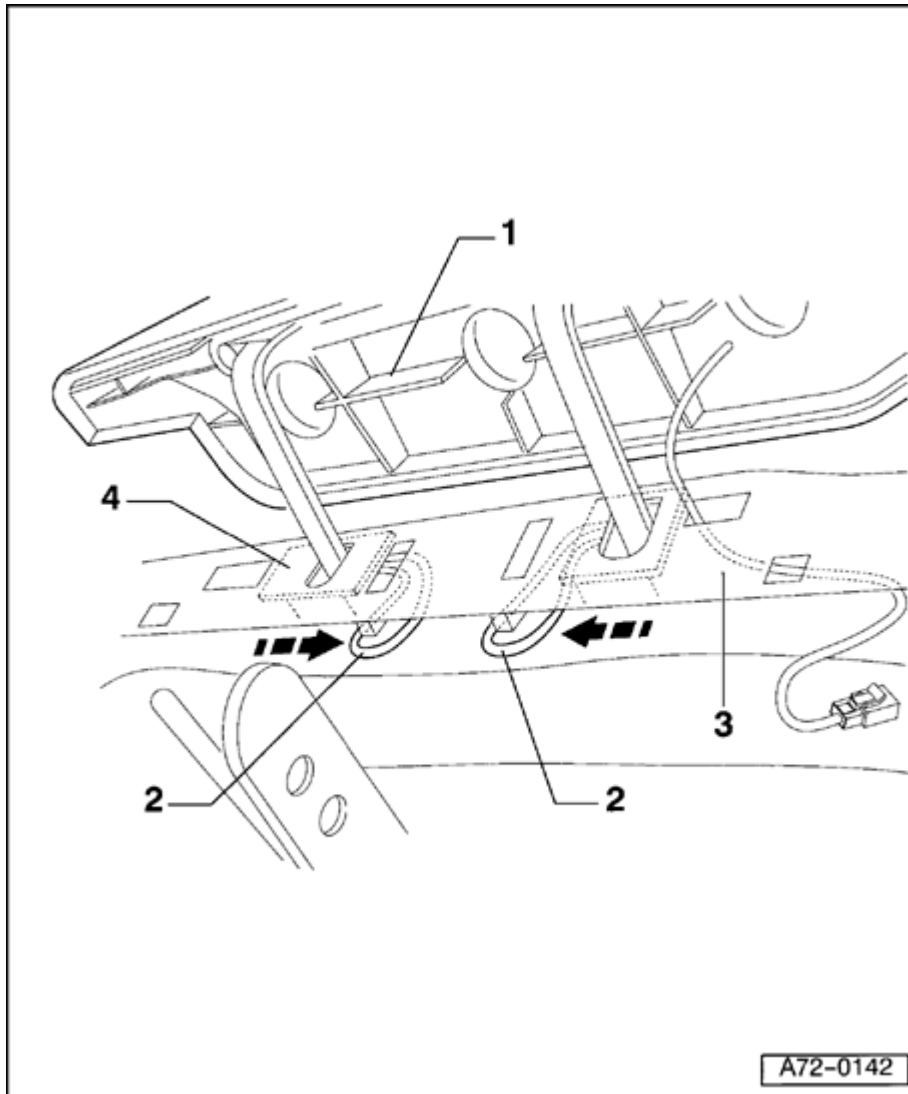
Both seat springs and their related rubber buffers located in the rear between the seat cushion and the backrest fall out by themselves.

Installing:

- Ensure rubber buffers 3 are correctly located in mountings on backrest.
- Install springs -4- in seat cushion.
- Insert electrical cover -2- between backrest and seat cushion.
- Install seat cushion -1- so springs -4- sit on rubber buffers -3- at backrest.
- Push seat cushion -1- toward rear.
- Push down on front of seat cushion -1-.
- If necessary, attach wiring in seat cushion.
- Install electrical cover beneath seat.

2 - Electrical cover**3 - Rubber buffers (2x)****4 - Springs (2x)**

72-34



Seat cushion extension, removing and installing

WARNING!

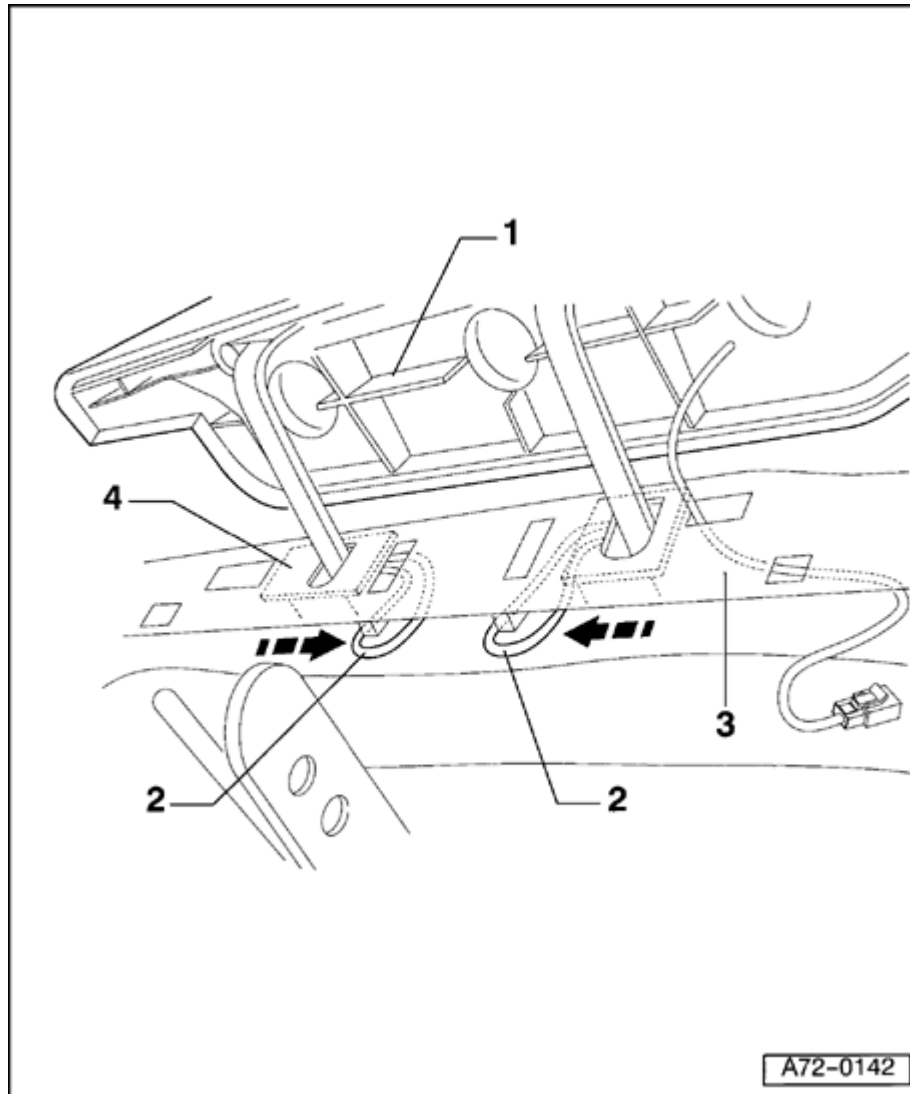
Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

1 - Seat cushion extension

Removing:

- Move seat fully up.
- Remove seat ⇒ [page 72-25](#) .
- Using pliers or screwdriver push both springs -2- inward (arrow).
- Remove seat cushion extension -1-.
- If necessary, disconnect seat heater wiring on both sides.
- Pull front cover -3- up and pull cable through.

2 - Springs (2x)



3 - Front cover

Removing:

- If necessary (e.g. when removing seat cushion), remove cover completely.

Installing:

- Insert seat heater cable harness connectors through holes on both sides of cover -3- and connect harness connectors.
- Attach cover.

4 - Guide sleeves (2x)

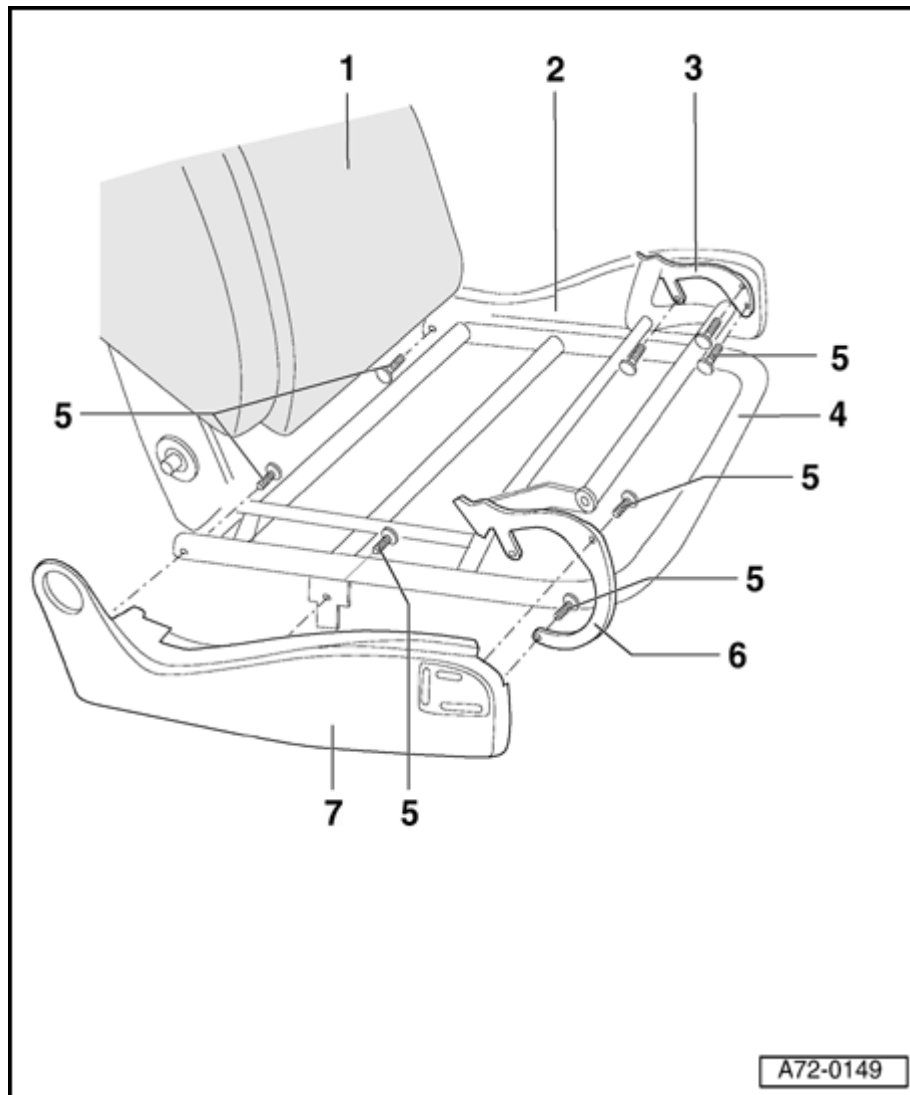
Removing:

- If necessary (e.g. when removing seat cushion), push guide sleeves -4- together with groove-lock pliers and pull guide sleeves out.

Installing:

Note:

Always replace guide sleeves when installing.



Side seat trim, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#).

1 - Backrest

2 - Side seat trim, tunnel side

Note:

It is not necessary to disconnect any wiring when removing side seat trim on tunnel side. Remainder of removal procedure is identical to removal of side seat trim on door sill side.

3 - Bracket for side seat trim, tunnel side

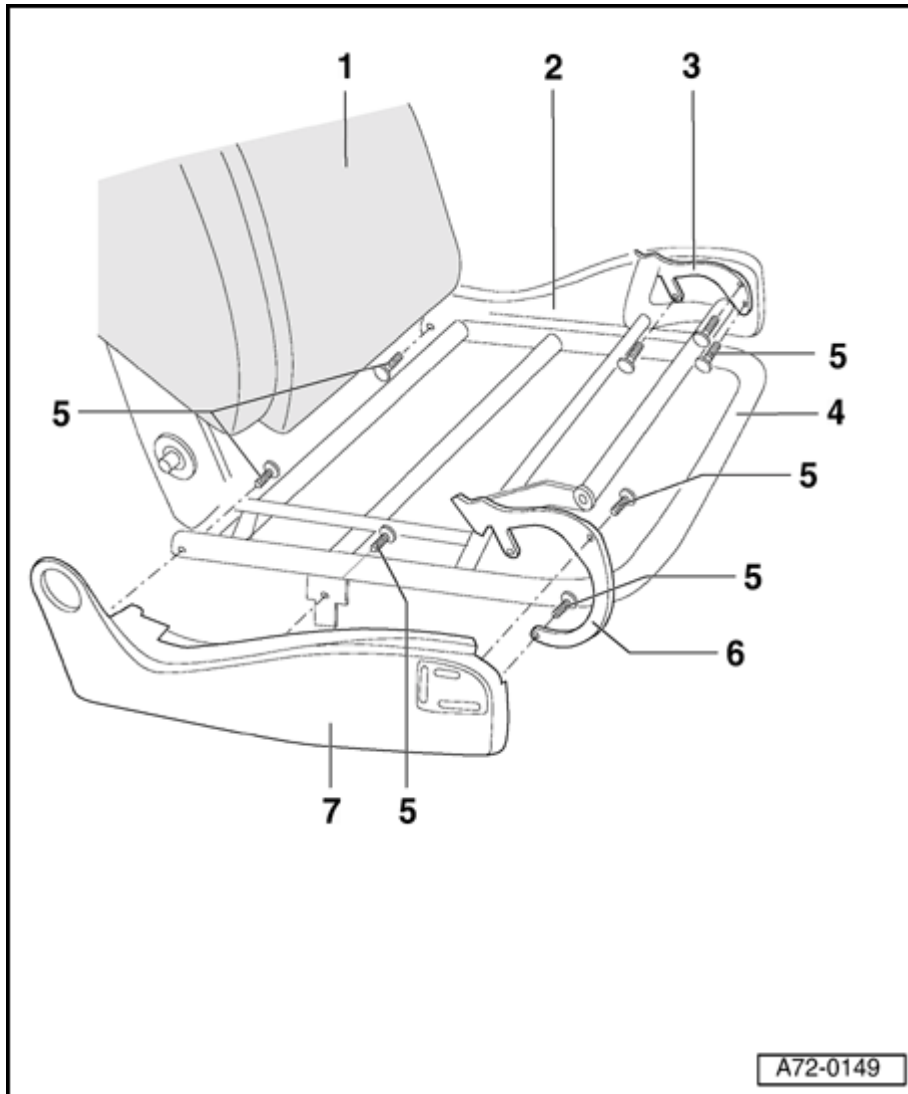
4 - Seat frame

5 - Bolts (4x per trim piece)

6 - Bracket for side seat trim, door sill side

A72-0149

72-37



7 - Side seat trim, door sill side

Removing:

- Move seat fully down.
- Remove seat ⇒ [page 72-25](#) .
- Remove mounting trim ⇒ [page 72-41](#) .
- Remove seat cushion ⇒ [page 72-32](#) .
- Rotate belt buckle downward.
- Disconnect all harness connectors that run from circuit board to side seat trim on door sill side.
- Cut all tie wraps on wiring harness using diagonal cutter.
- Unbolt bolts -5- (4x) on side seat trim.

Installing:

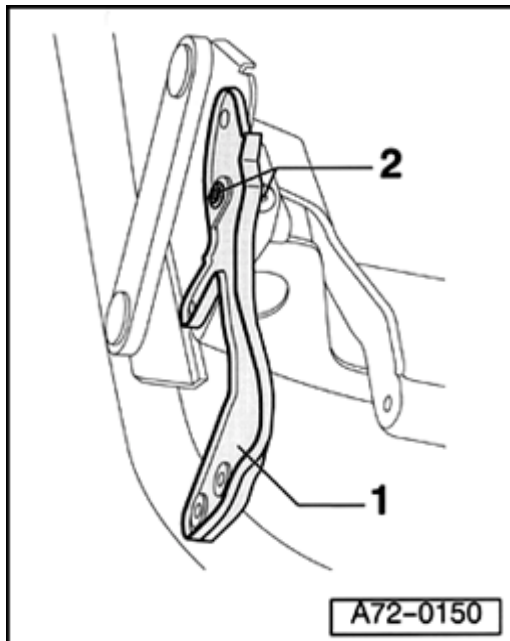
- Attach trim on lower mounting of backrest frame.
- Secure side seat trim with bolts -4- (4x).

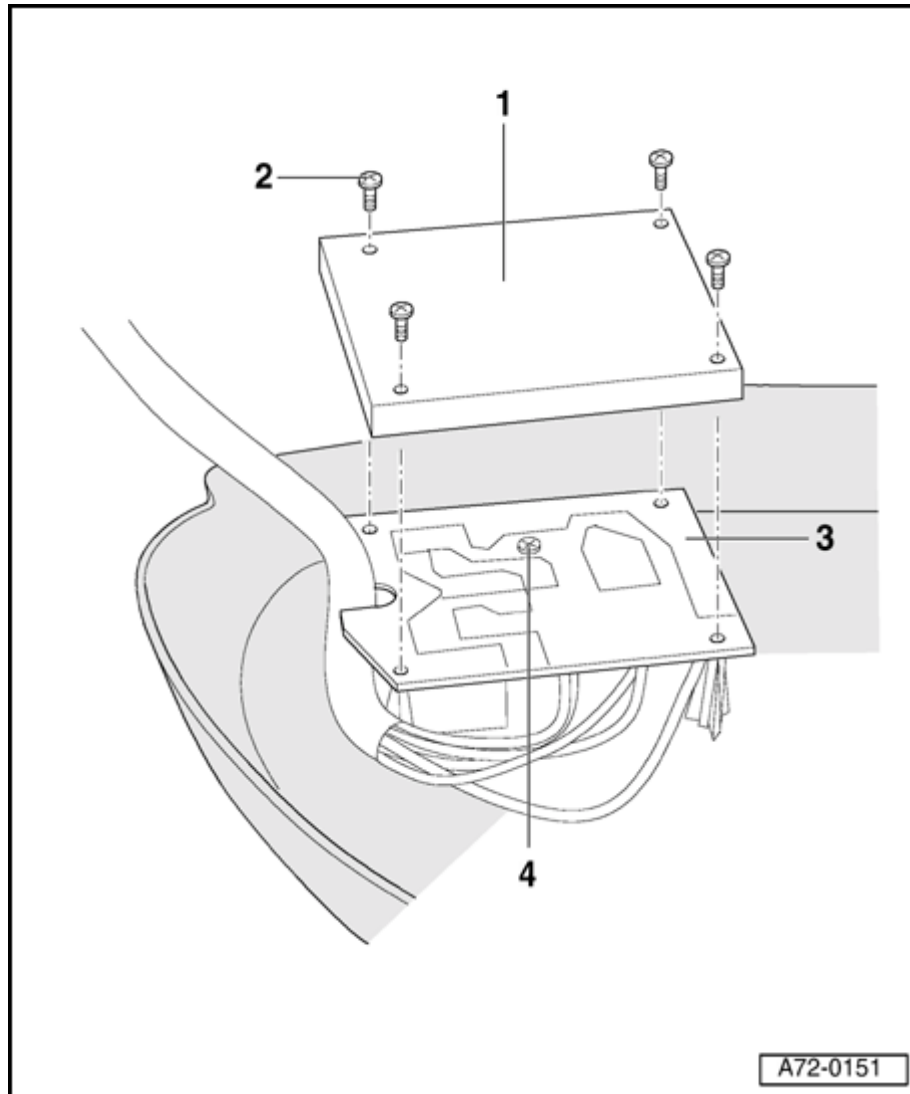
Side seat trim bracket, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

- Move seat to upper-most position.
- Remove seat ⇒ [page 72-25](#) .
- Remove side seat trim ⇒ [page 72-36](#) .
- 4 - Drill through both rivets -2- at front of side seat trim bracket -1- and remove bracket.





Switch unit circuit board, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#).

CAUTION!

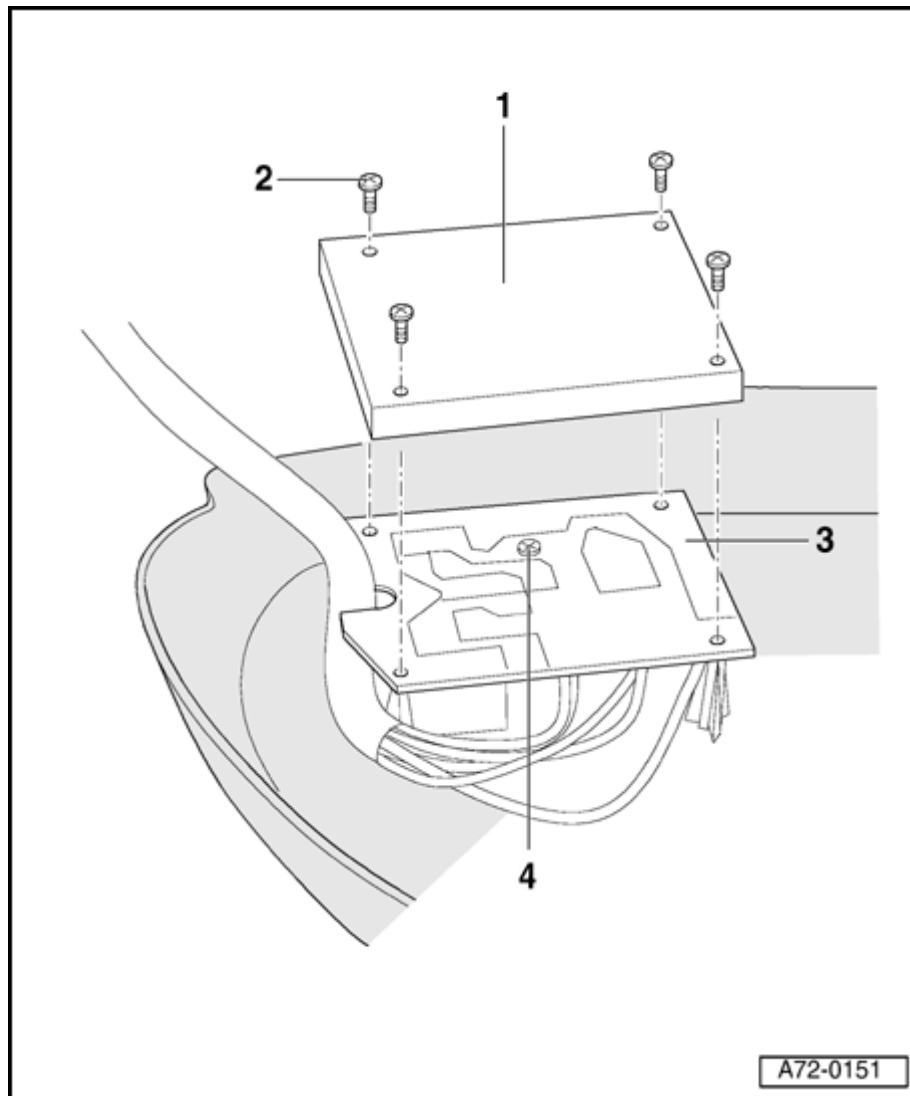
Only the switch circuit board can be removed. The switches in the side seat trim cannot be replaced separately.

Note:

The switch unit circuit board is installed in the side seat trim on door sill side.

1 - Plastic cover

2 - Bolts (4x)



3 - Switch unit circuit board with wiring harness

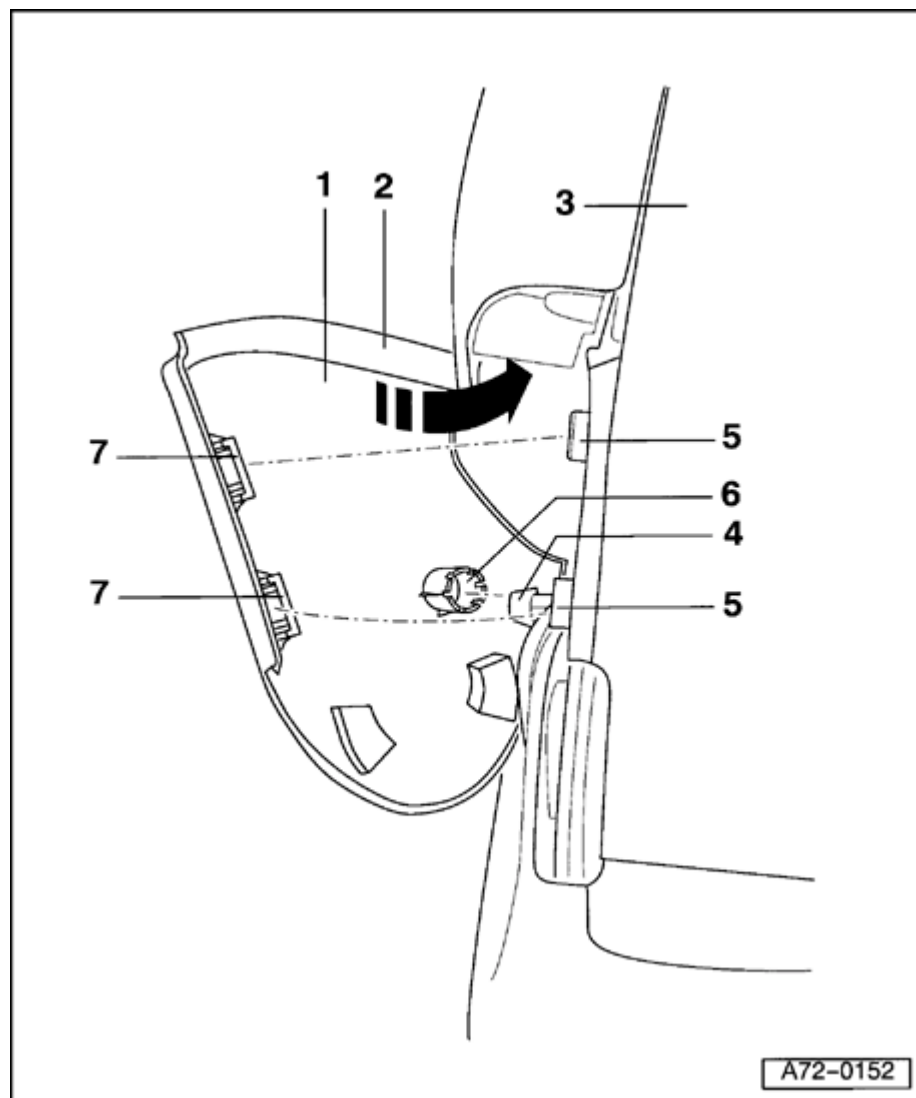
Removing:

- Move seat to bottom-most position.
- Remove seat ⇒ [page 72-25](#) .
- Remove door sill side seat trim ⇒ [page 72-36](#) .
- Cut all tie wraps on wiring harness using diagonal cutter.
- Disconnect all wiring harness connectors to circuit board.
- Remove bolts -2- (4x) at plastic cover -1- located above circuit board -3-.
- Remove plastic cover -1-.
- Remove bolt -4-.
- Carefully remove circuit board.

Installing:

- Carefully install circuit board so circuit board contacts seat correctly on contacts for switch located in side seat trim.

4 - Bolt (1x)



Mounting trim, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

1 - Mounting trim

Removing:

- Remove seat ⇒ [page 72-25](#) .
- Remove mounting trim -1- downward, so pins -4- and tabs -5- are pulled out of catches -6- and -7-.
- Pull out mounting trim -1-.

Installing:

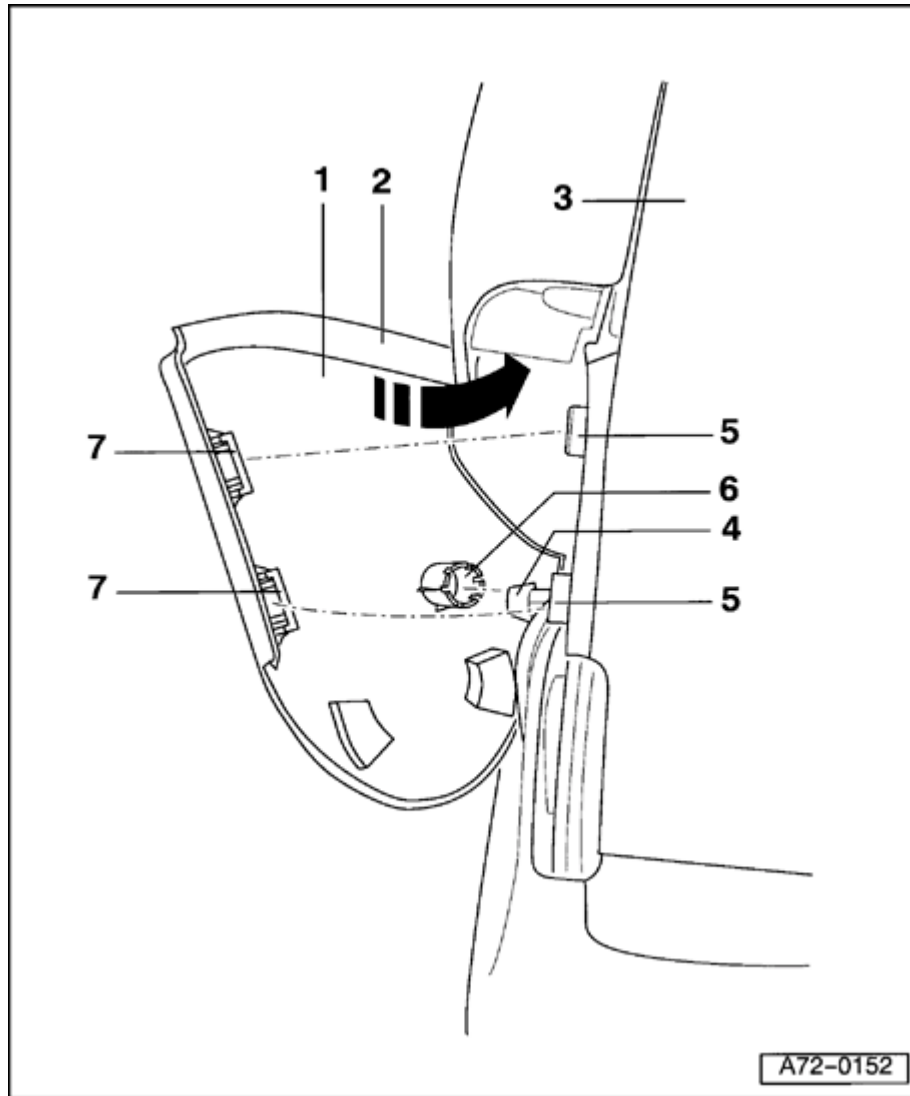
- On same side of side airbag unit, insert insertion edge -2- under side airbag module in direction of arrow.
- Install mounting trim evenly so pins -4- and tabs -5- engage in catches -6- and -7-.

2 - Insertion edge

- ◆ Only on same side of side airbag module

3 - Backrest

72-42

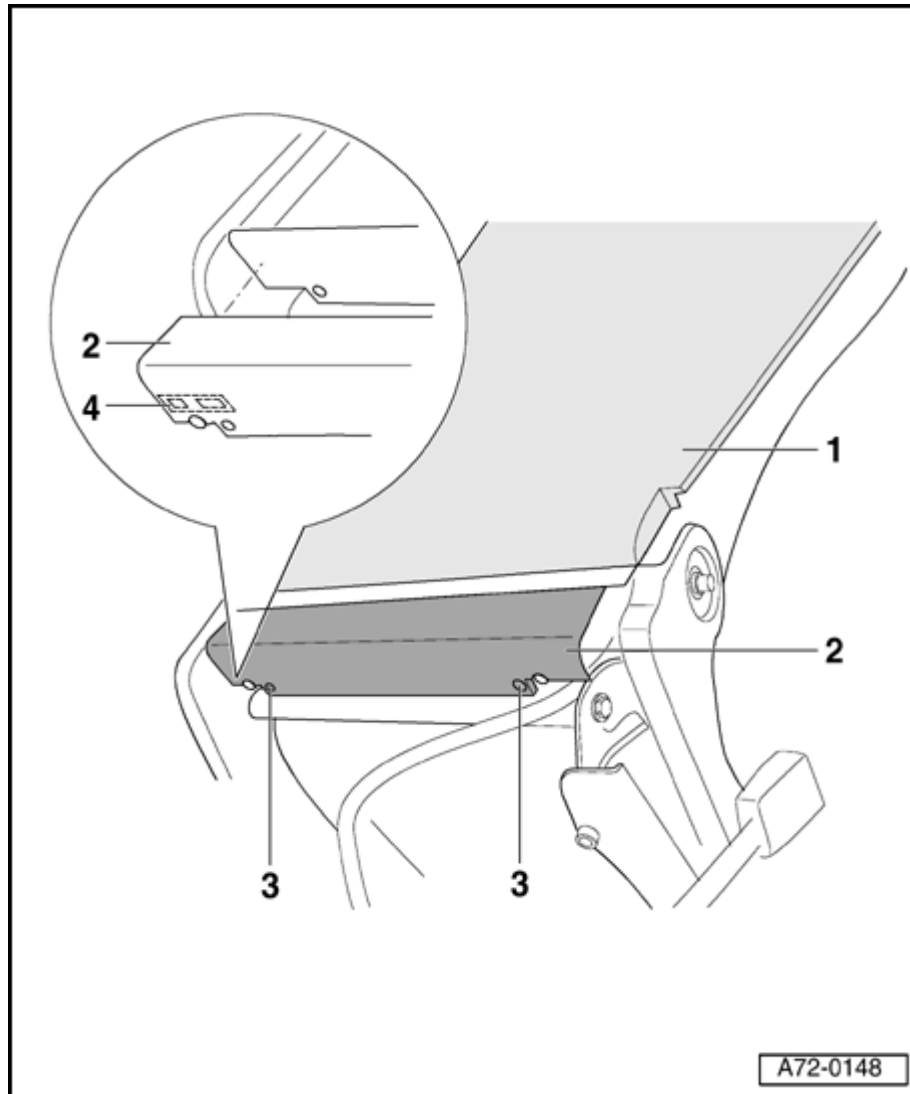


4 - Pins

5 - Clip

6 - Pin catch

7 - Tab catches



Spring cover, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#).

1 - Backrest

2 - Spring cover

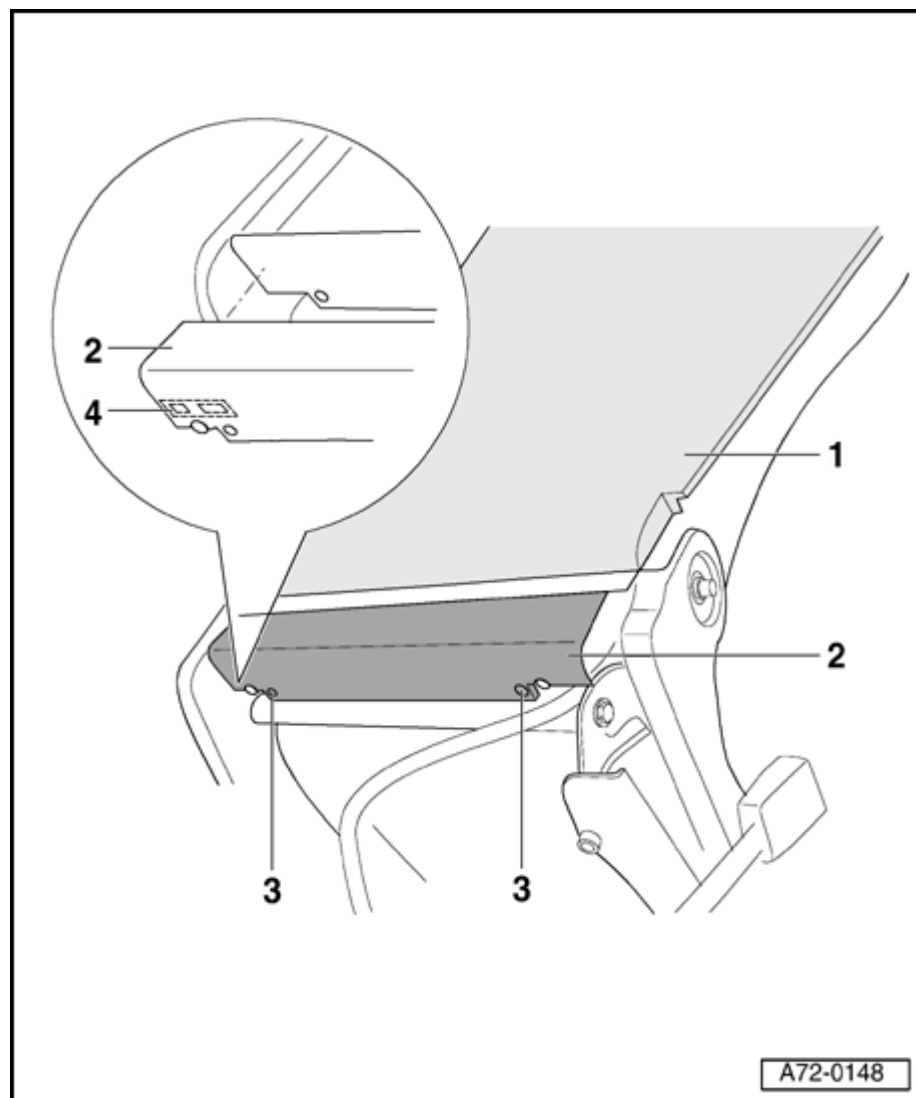
Removing:

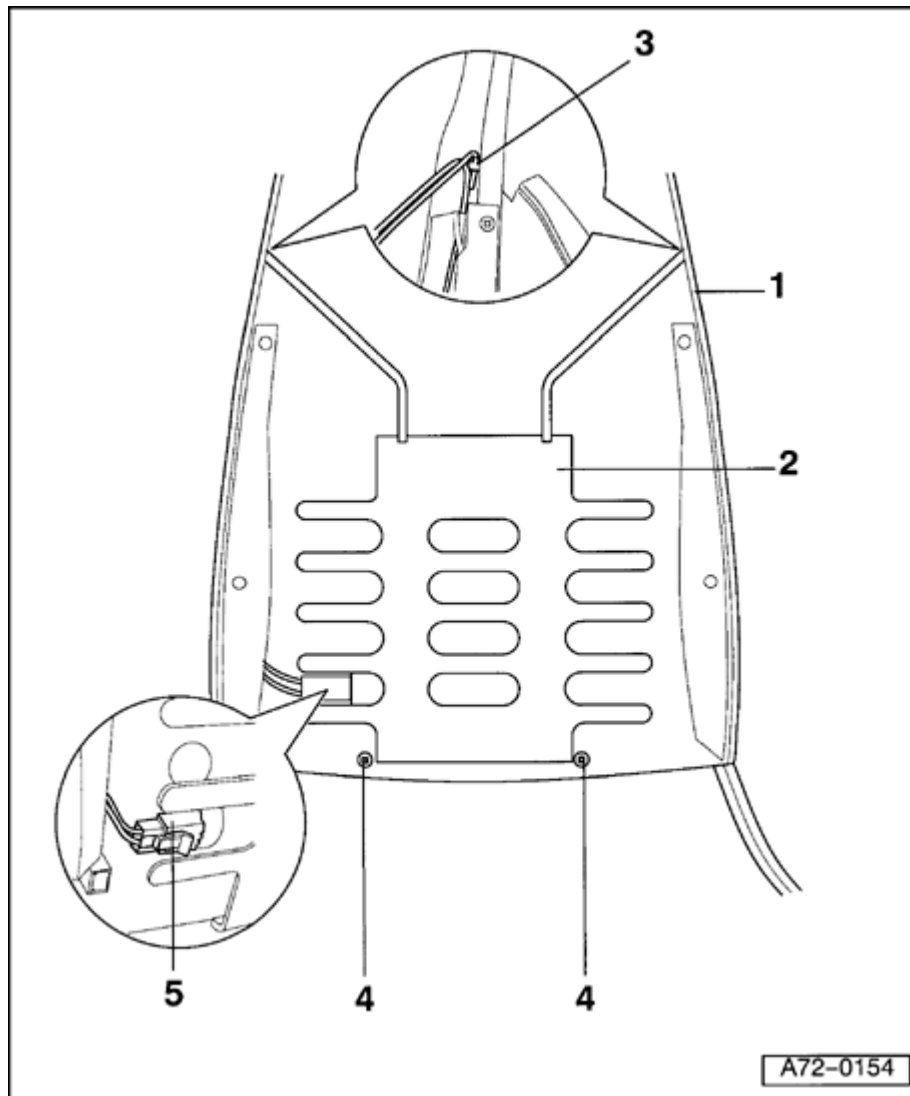
- Move seat fully up.
- Unbolt two bolts -3- on left and right of spring cover -2-.
- Pull off spring cover -2- from right-side of seat.
- Then pull spring toward right so clip -4- detaches from left-side of spring cover.
- Remove spring cover -2- from seat.

Installing:

- Install left side of spring cover -1- with clip -4-.
- Push spring cover -2- onto right-side until it engages.
- Tighten both bolts -3-.

72-44

**3 - Bolts (2x)****4 - Clip**



2-way lumbar support, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

1 - Backrest frame

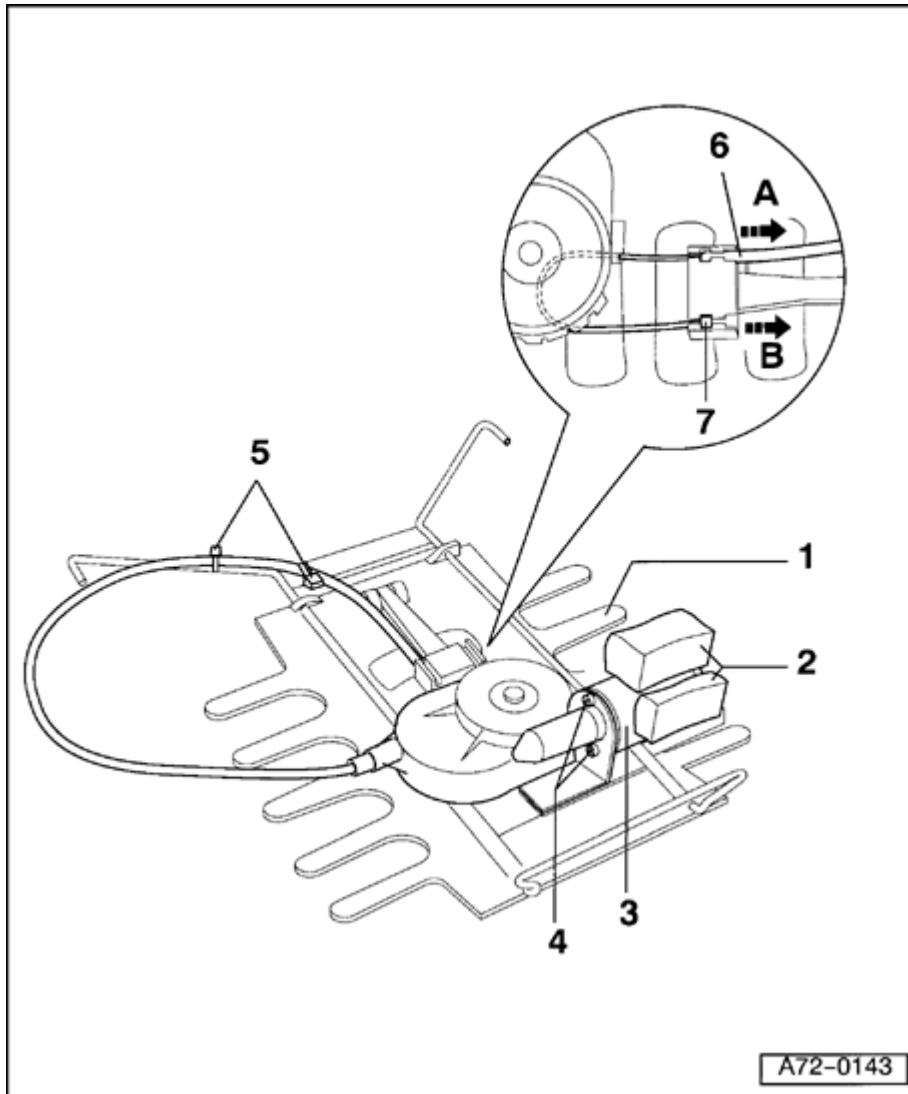
2 - 2-way lumbar support

- Remove seat ⇒ [page 72-25](#) .
- Remove backrest upholstery ⇒ [page 74-22](#) .
- Disconnect harness connector for lumbar support motor -5-.
- Remove bolts -4- (2x).
- Remove bolts -4- (2x).

3 - Retaining hook

4 - Bolts (2x)

5 - Harness connector for lumbar support motor



Lumbar support motor with transmission, removing and installing

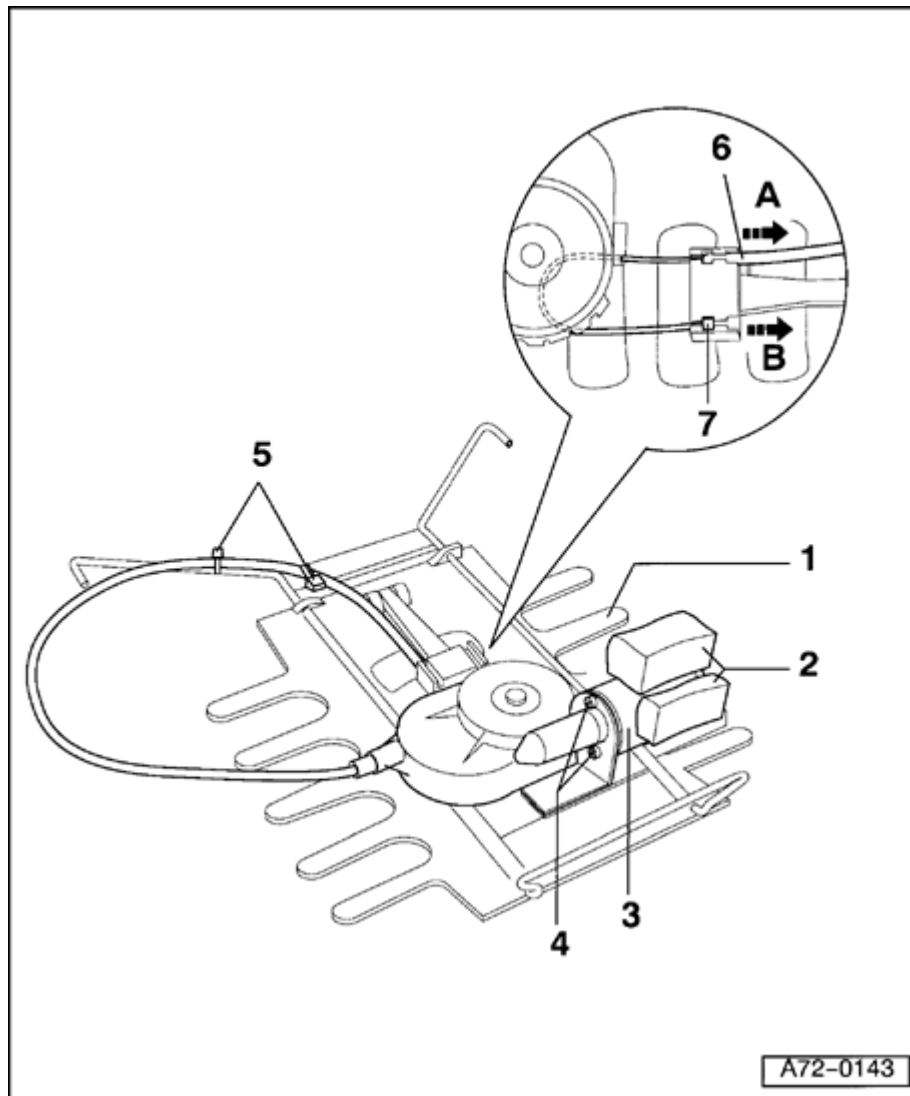
WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#).

1 - Lumbar support body

2 - Foam pieces (2x)

- ◆ If not available as a replacement part, detach foam pieces from old motor and attach to new motor



3 - Motor with transmission and Bowden cable

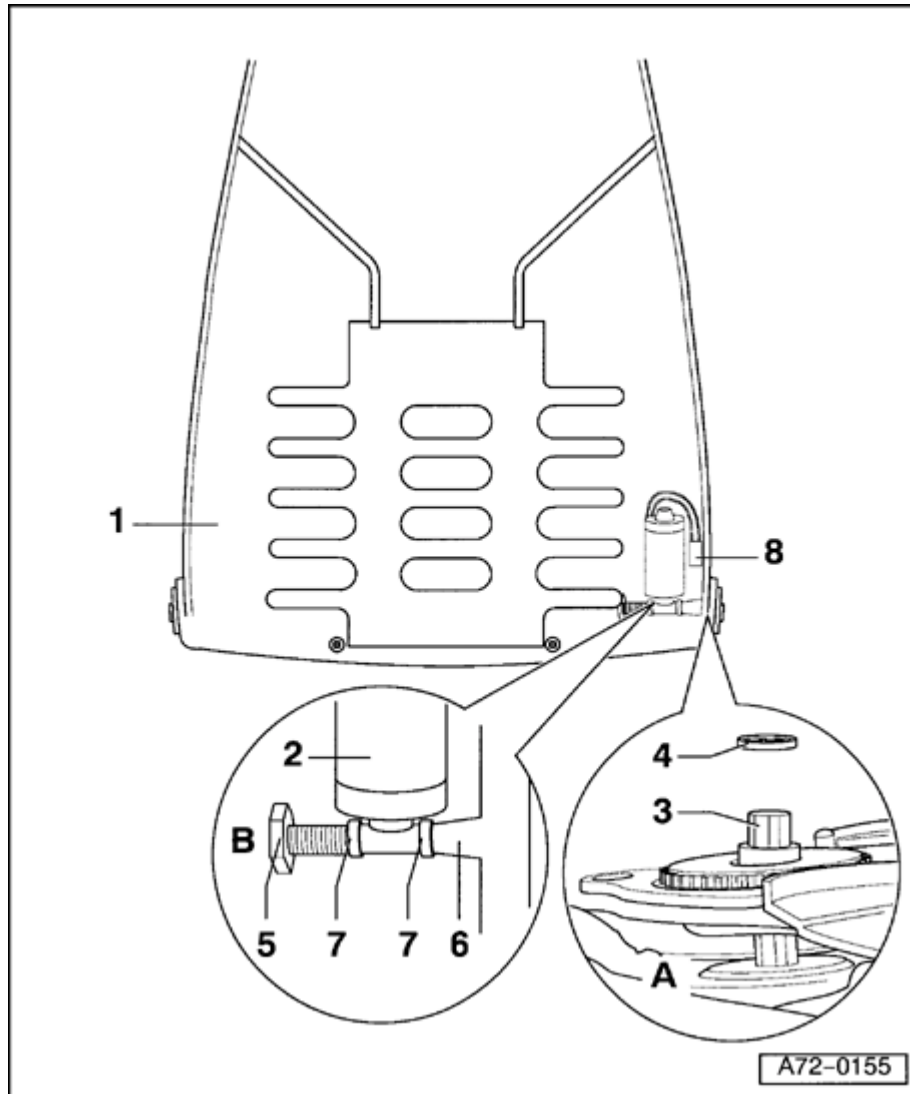
- Remove seat ⇒ [page 72-25](#) .
- Remove 2-way lumbar support ⇒ [page 72-45](#) .
- Cut tie wraps -5- (2x).
- Push lumbar support body together.
- Pull Bowden cable -6- in direction of arrow -A-.
- Detach Bowden cable -6- at pulley.
- Pull set pin -7- in direction of arrow -B- out of bracket.
- Remove bolts -4- (2x).

4 - Bolts (2x)

5 - Tie wraps

6 - Bowden cable

7 - Set pin



Backrest motor with transmission, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

Note:

Illustration only shows backrest.

1 - Backrest frame

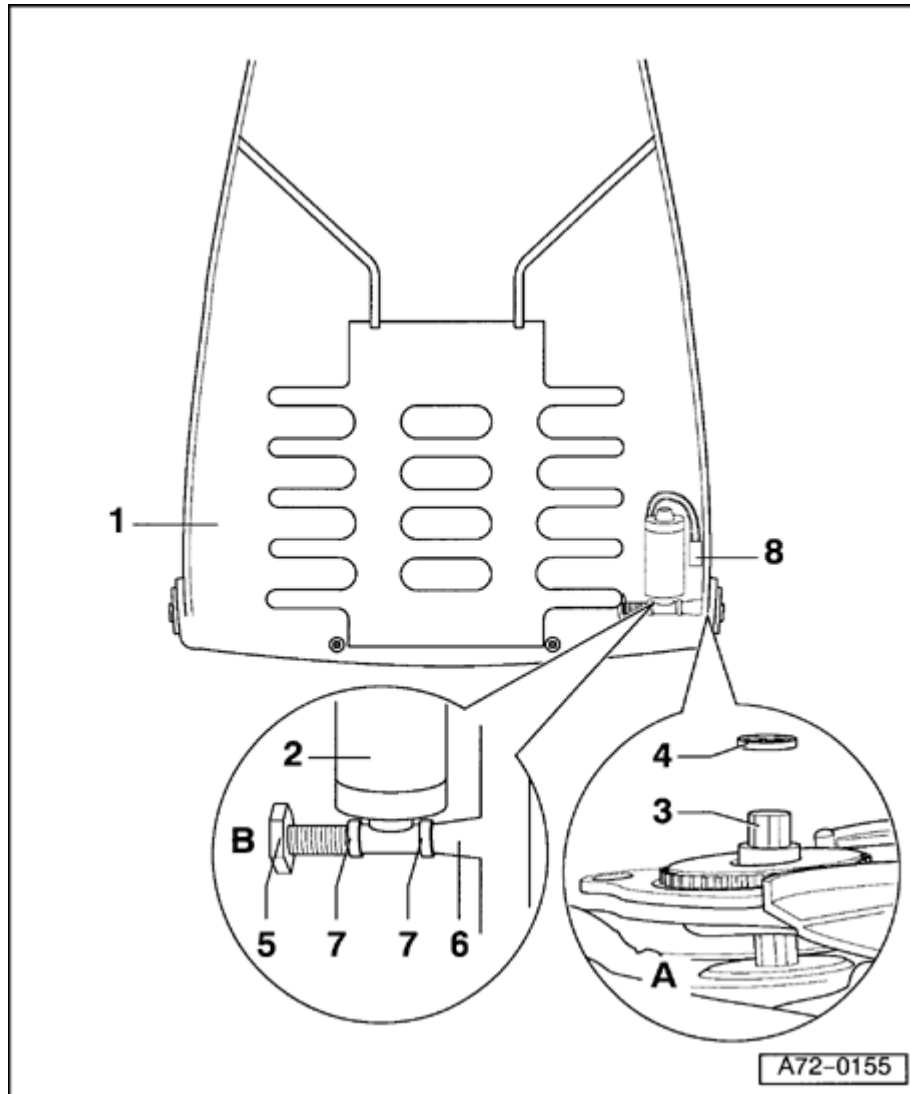
2 - Backrest motor with transmission

Removing:

- Move seat fully up.
- Remove seat ⇒ [page 72-25](#) .
- Remove trim panels ⇒ [page 72-41](#) .
- Remove backrest upholstery ⇒ [page 74-22](#) .
- Using screwdriver, remove spring washer -5- on backrest motor side (-B- in illustration).
- Pull shaft out of backrest frame -1- far enough so backrest motor -2- can be removed.
- Cut all tie wraps on backrest motor using

diagonal cutter.

72-49

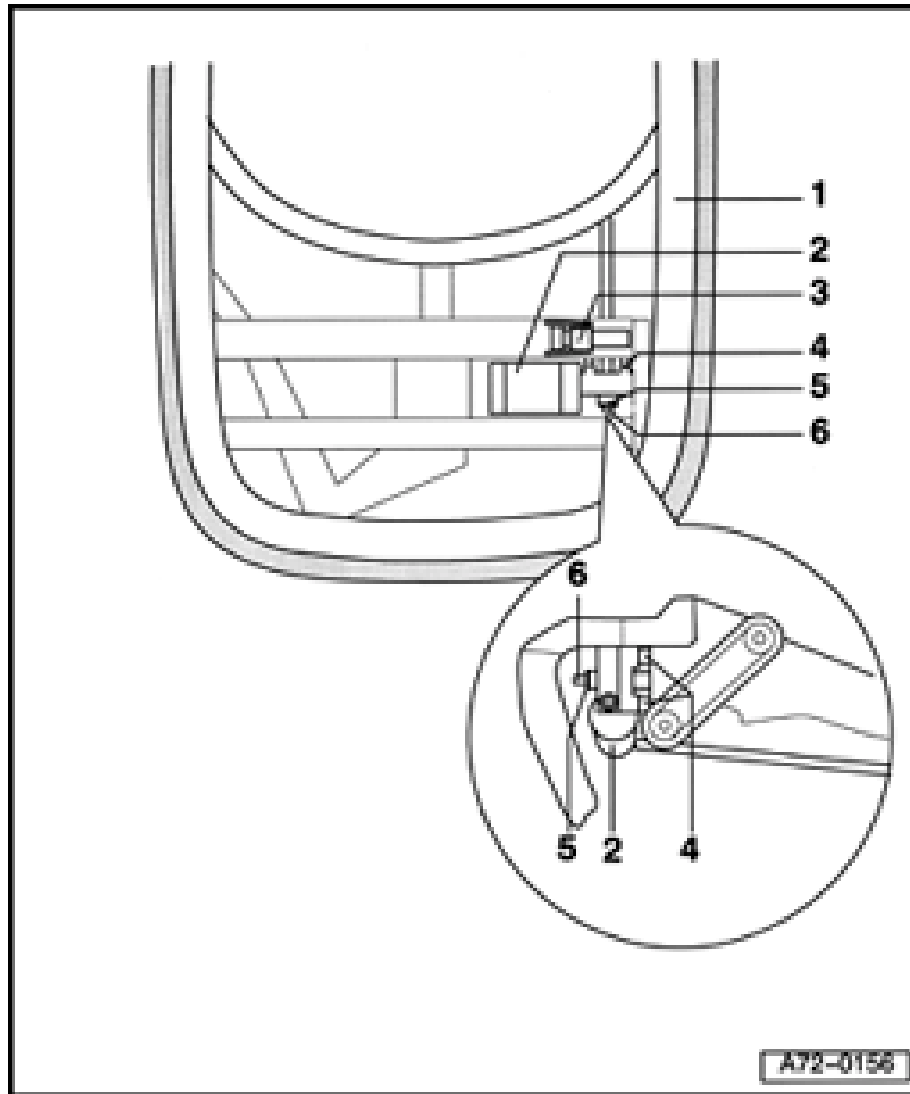


- Disconnect harness connector -8-.
- Unbolt mounting screw of backrest motor -5- from welded threaded bushing -6-.
- Remove backrest motor -2-.

Installing:

- Push shaft -3- through backrest motor -2- and backrest frame -1-.
- Secure backrest motor -2- between two plastic washers -7- using mounting screw -5- on threaded bushing -6-.
- Tap locking washer -4- onto shaft -3-.

3 - Shaft**4 - Locking washer****5 - Mounting screw****6 - Threaded bushing****7 - Plastic washers (2x)****8 - Harness connector**



Motor for seat height adjustment, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

1 - Seat frame

2 - Seat height motor adjustment

Removing:

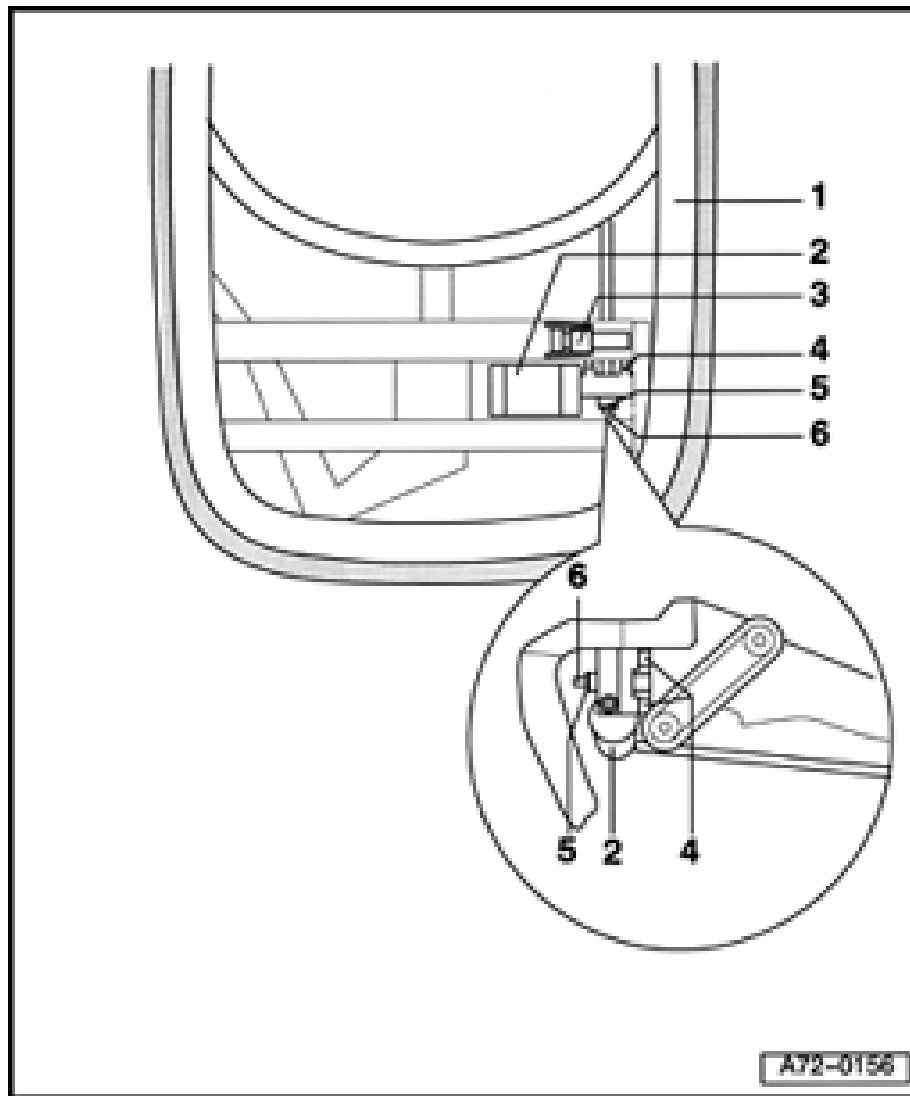
- Move seat fully up.
- Remove seat ⇒ [page 72-25](#) .
- Remove seat cushion ⇒ [page 72-32](#) .
- Disconnect harness connector -3-.
- Disconnect harness connector -3- housing from seat frame.
- Using screwdriver, lift locking washer -5- from shaft -6-.
- Remove motor -2-.

Installing:

Note:

Ensure that bushings -4- are correctly seated in the seat frame.

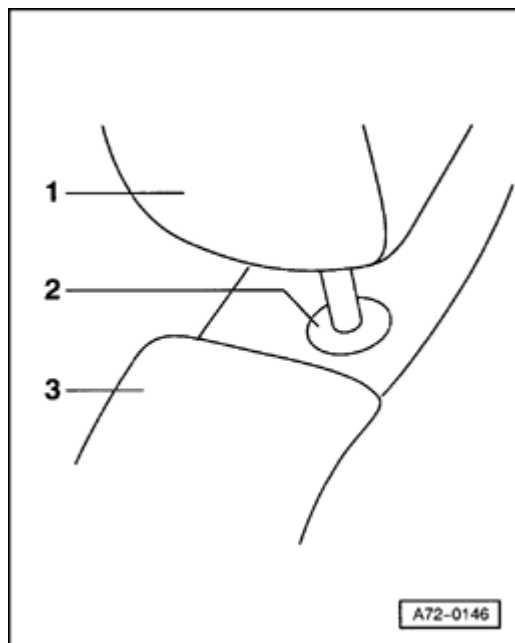
72-51

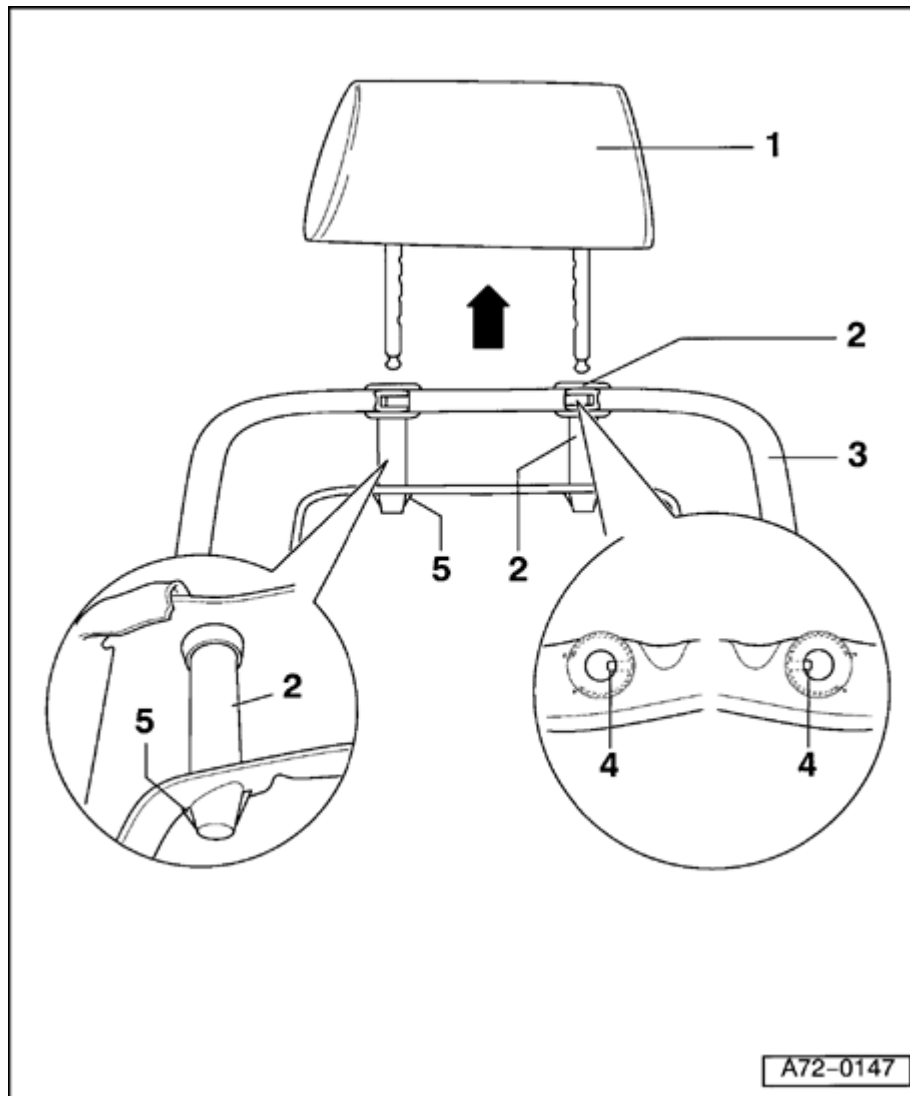


Headrest, removing and installing

4

- Press down on guide sleeves -2- from above.
- Press down slightly on headrest -1- to release catch.
- Pull headrest -1- up and off of backrest -3-.





Headrest guides, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

1 - Headrest

2 - Headrest guide

Removing:

- Remove headrest -1- ⇒ [page 72-52](#) .
- Remove upholstery from backrest frame - 3- ⇒ [page 74-22](#) .
- Press catches -5- of headrest guide -2- together and pull headrest guide -2- up and off.

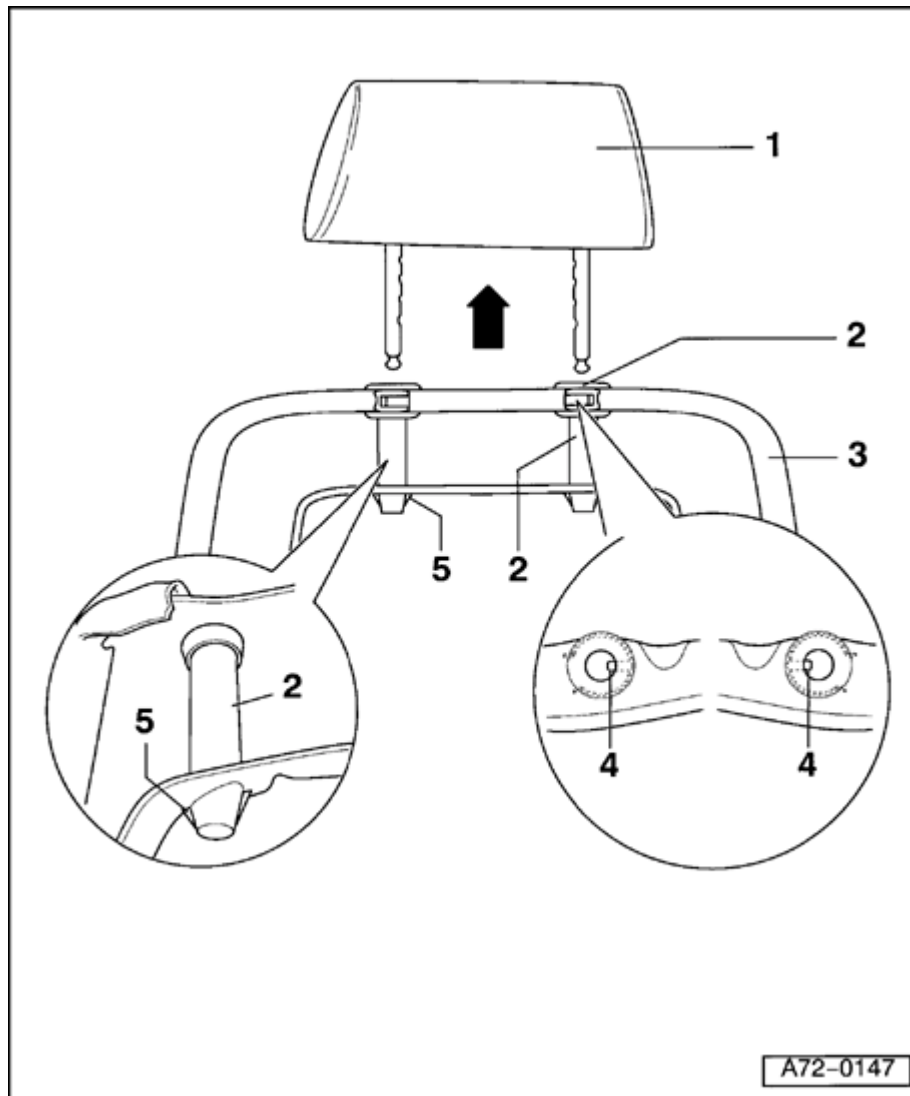
Installing:

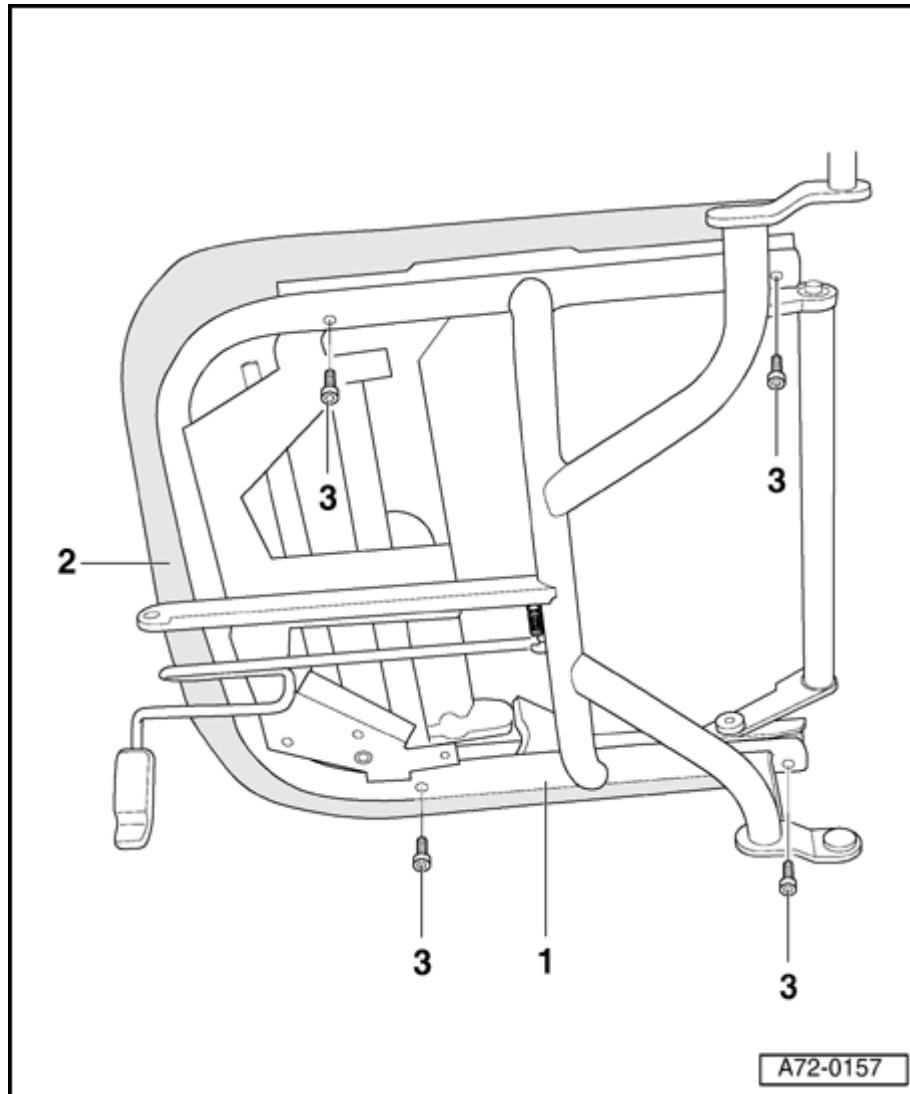
CAUTION!

The locking pins for both headrest guides must be on the inside so that they engage in the height adjustment catches.

- Install headrest guides -2- so locking pins -4- of headrest guides are both on inside.

72-54

**3 - Backrest frame****4 - Locking pins****5 - Catches**



Seat frame, removing and installing

WARNING!

Before starting work on seats, connect VAS 5094 airbag adapter ⇒ [page 72-9](#) .

1 - Seat frame

Removing:

- Remove seat ⇒ [page 72-25](#) .
- Place seat so underside of seat cushion is easily accessible.
- Disconnect tie wraps that are attached to seat frame.
- Unbolt bracket for harness connector (two bolts).
- Unbolt both relays (2x).
- Unbolt bolts -3- (4x) on seat frame -1-.
- Remove seat frame -1- from seat -2-.

Installing:

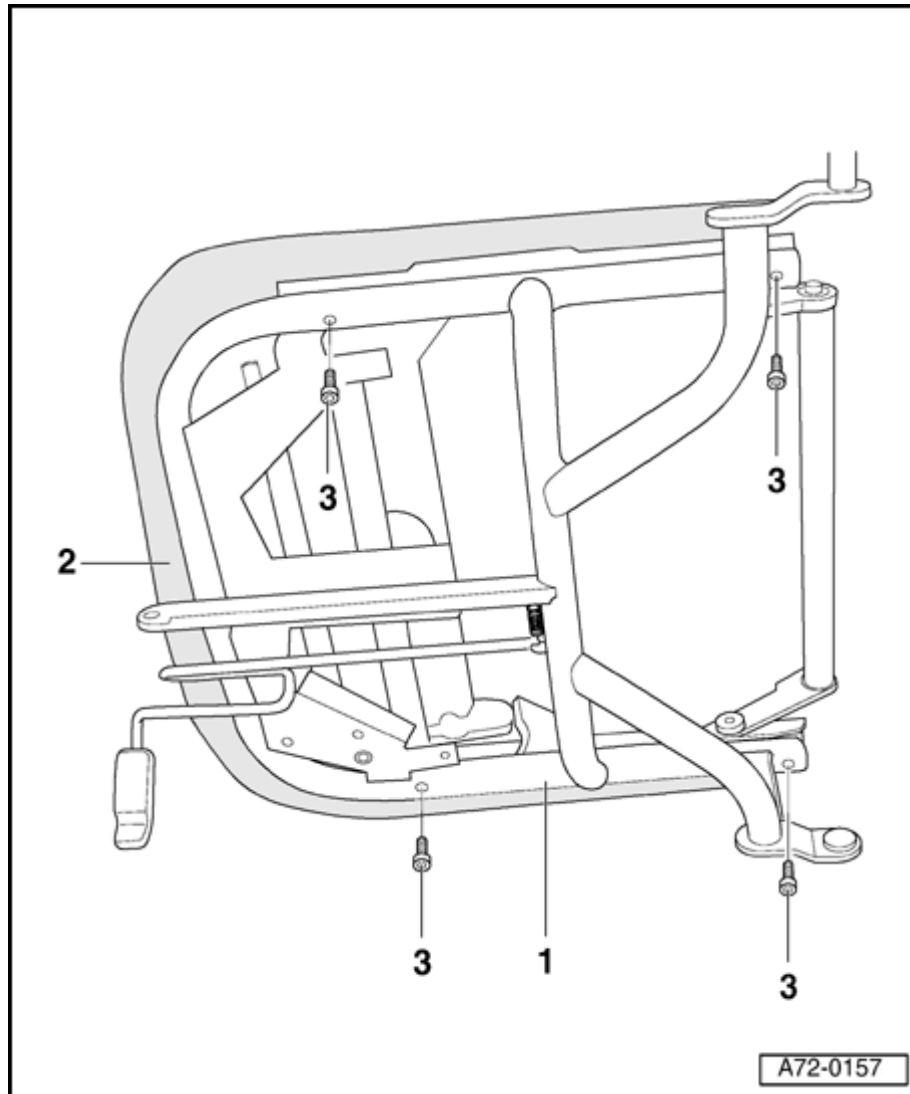
Note:

Always replace bolts -3-.

- Place new seat frame -1- on seat -2-.

- Tighten bolts -3- (4x) to 23 Nm (17 ft lb).

72-56

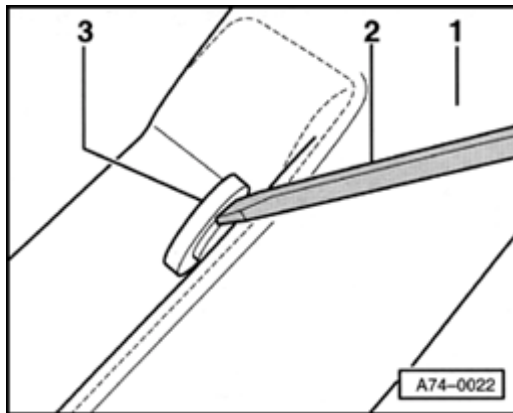
**2 - Seat****3 - Bolts (4x)**

◆ 23 Nm (17 ft lb)

72-57

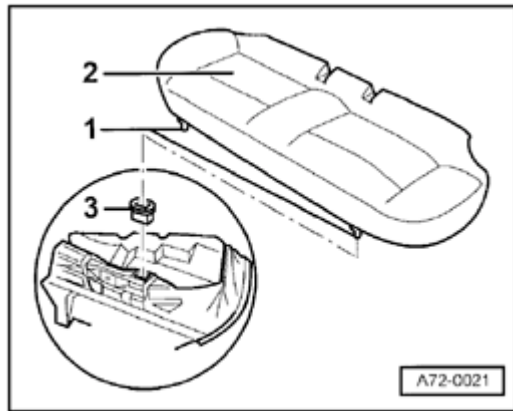
Rear seat

Rear seat, removing and installing



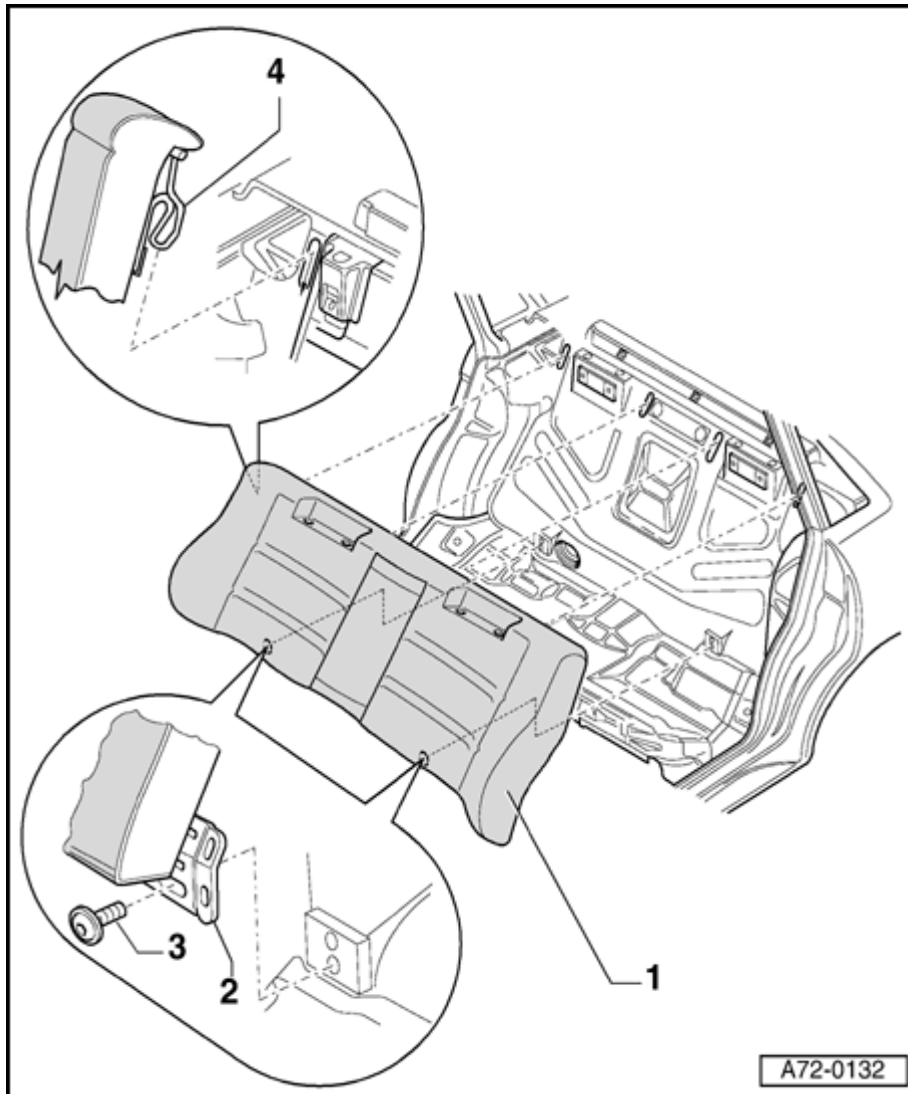
A

- Using screwdriver -2-, carefully lift headrest guides -3- out of rear backrest -1-.



A

- Detach rear seat -2- upward out of mounting -3-.
- To install, brackets -2- must be pushed into mountings -3-.



One-piece rear seat backrest, removing and installing

1 - One-piece backrest

- Remove rear seat ⇒ [page 72-57](#) .
- Remove headrests ⇒ [page 72-70](#) .
- For vehicle with ski sack, remove ski sack frame ⇒ [page 74-31](#) .
- Remove headrest guides ⇒ [page 72-67](#) .
- Remove bolts -3- (2x).
- Push rear backrest -1- up and detach rear backrest -1- from brackets -4- (4x).

Vehicles with LATCH System:

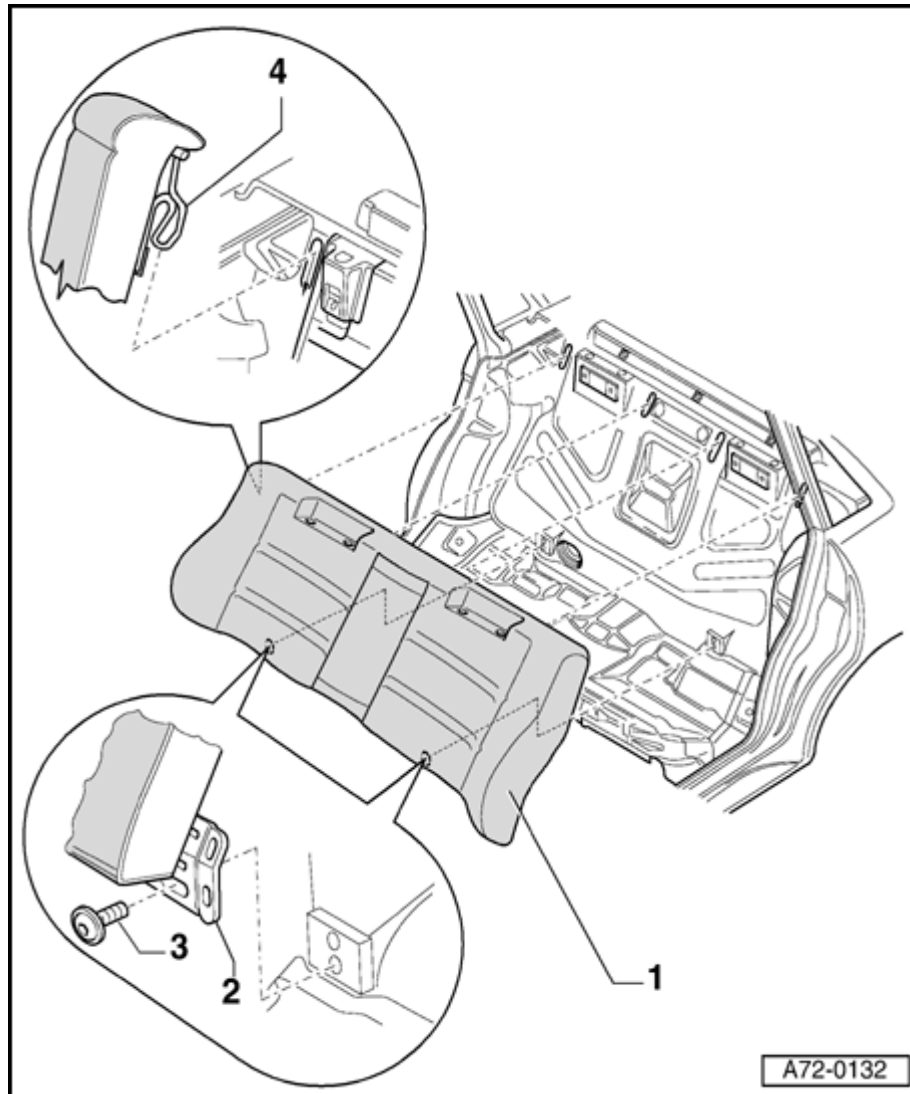
- Remove tabs -2- behind LATCH bracket.

Notes:

- ◆ To install rear backrest, push tab -2- behind LATCH bracket.
- ◆ If LATCH is retrofitted, it may be necessary to flatten tab -2- in vise down to about 3 mm.

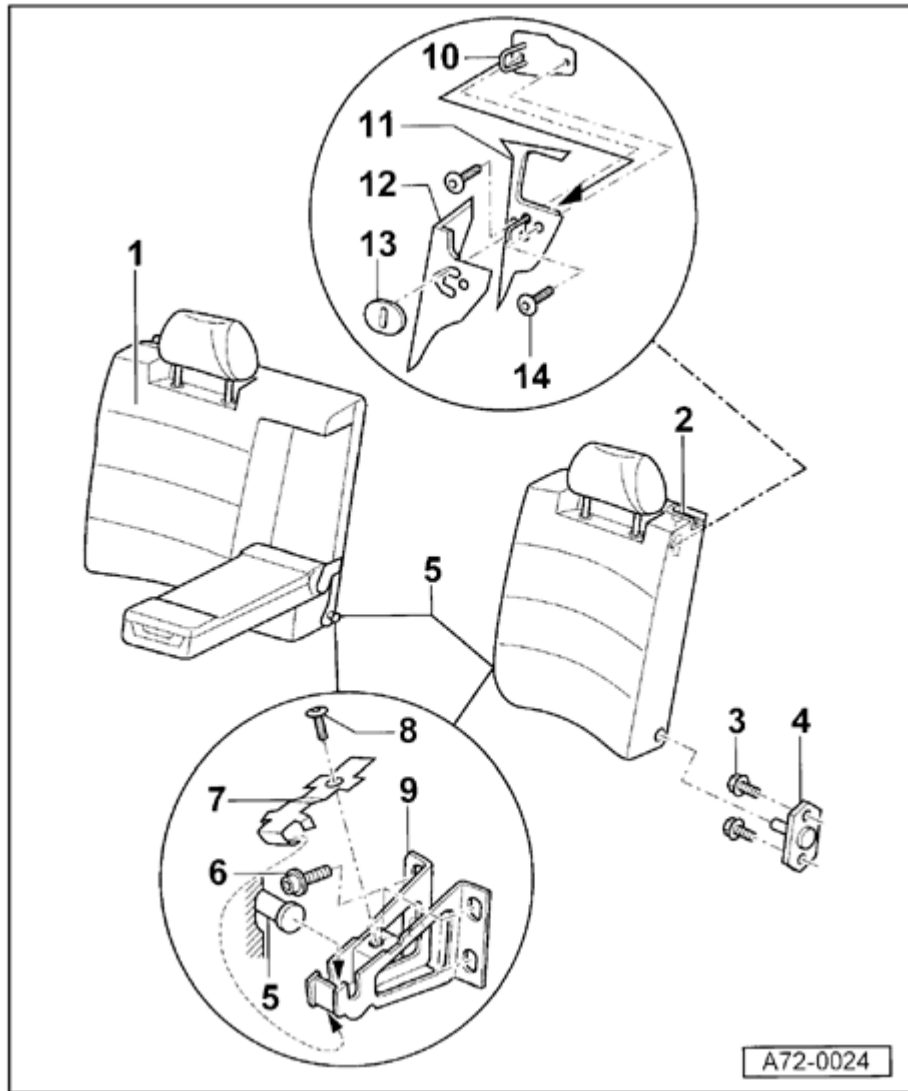
2 - Tab

72-59

**3 - Bolts (2x)**

◆ 8 Nm (71 in. lb)

4 - Hooks (4x)



Split rear seat backrest (Sedan), removing and installing

1 - 2/3 rear backrest

Removing:

- Remove bolt -8- and remove center mounting bracket clip -7-.
- Lift rear backrest out of center mounting bracket -9- and pull toward center of car out of fitting -4-.

Installing:

- ◆ Installation is the reverse of removal

2 - 1/3 rear backrest

- ◆ Removal and installation procedures are same as 2/3 rear backrest

3 - Bolts (2x)

- ◆ 16 Nm (12 ft lb)

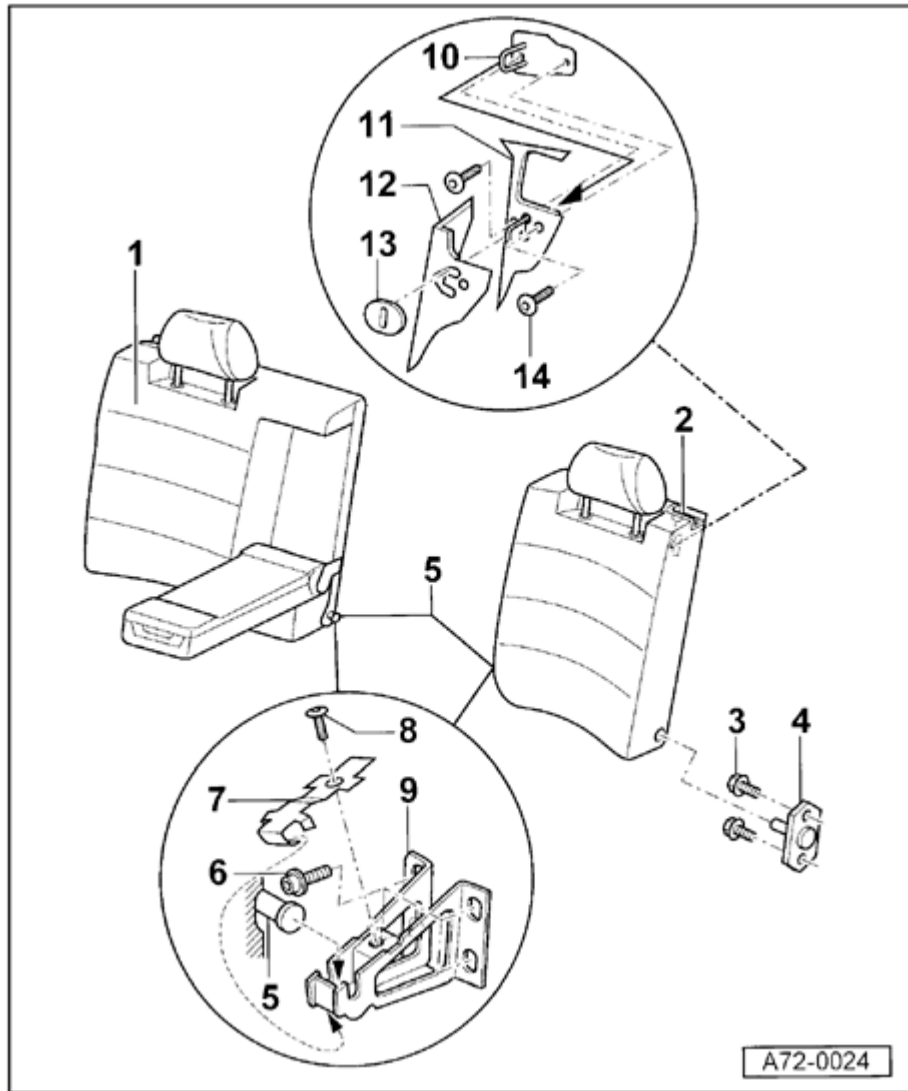
4 - Fitting

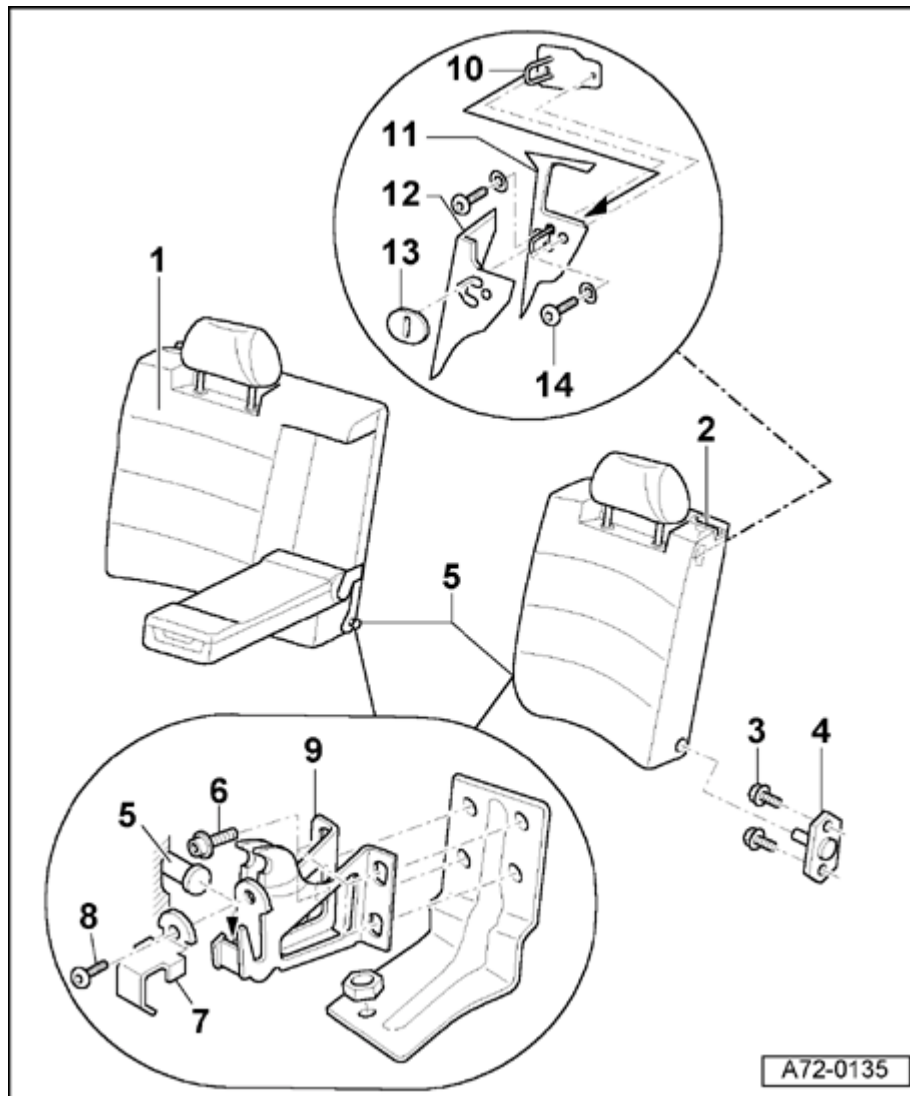
5 - Guide for rear backrest

6 - Bolt (4x)

- ◆ 16 Nm (12 ft lb)

72-61





Split rear backrest (Avant ➤ m.y. 1998), removing and installing

1 - 2/3 rear backrest

Removing:

- Remove bolt -8- and remove center mounting bracket clip -7-.
- Lift rear backrest out of center mounting bracket -9- and pull toward center of car out of fitting -4-.

Installing:

- ◆ Installation is the reverse of removal

2 - 1/3 rear backrest

- ◆ Removal and installation procedures are same as 2/3 rear backrest

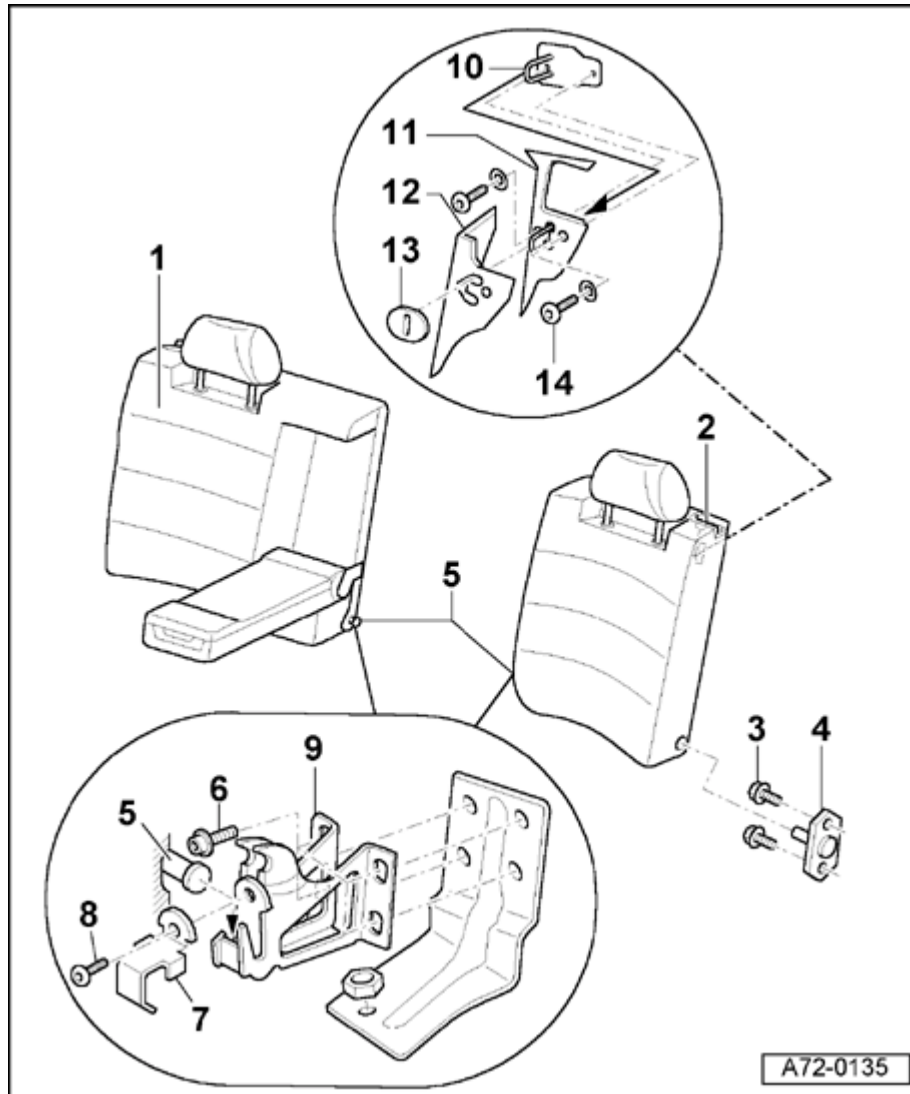
3 - Bolts (2x)

- ◆ 16 Nm (12 ft lb)

4 - Fitting

5 - Guide for rear backrest

72-63

**6 - Bolt (4x)**

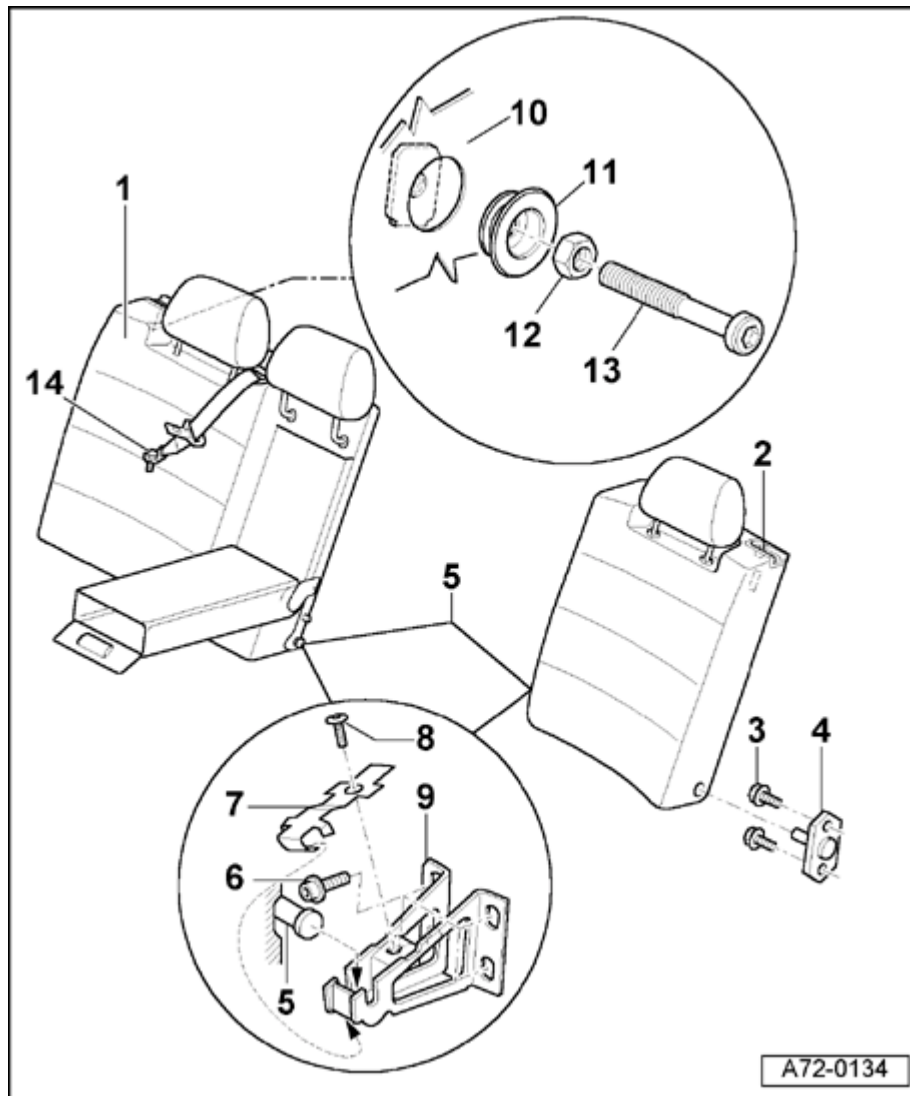
◆ 16 Nm (12 ft lb)

7 - Center mounting bracket clip**8 - Bolt**

◆ 8 Nm (71 in. lb)

9 - Center mounting bracket**10 - Locking stirrup****11 - Rear panel****12 - Trunk trim****13 - Base plate****14 - Bolt**

◆ 8 Nm (71 in. lb)



Split rear backrest (Avant m.y. 1998 ➤), removing and installing

1 - 2/3 rear backrest

Removing:

- Remove rear seat ⇒ [page 72-57](#) .
- Disconnect harness connector to belt tensioner ⇒ [Fig. 2](#) .
- Remove bolt -14-.
- Remove bolt -8- and remove center mounting bracket clip -7-.
- Lift rear backrest out of center mounting bracket -9- and pull toward center of car out of fitting -4-.

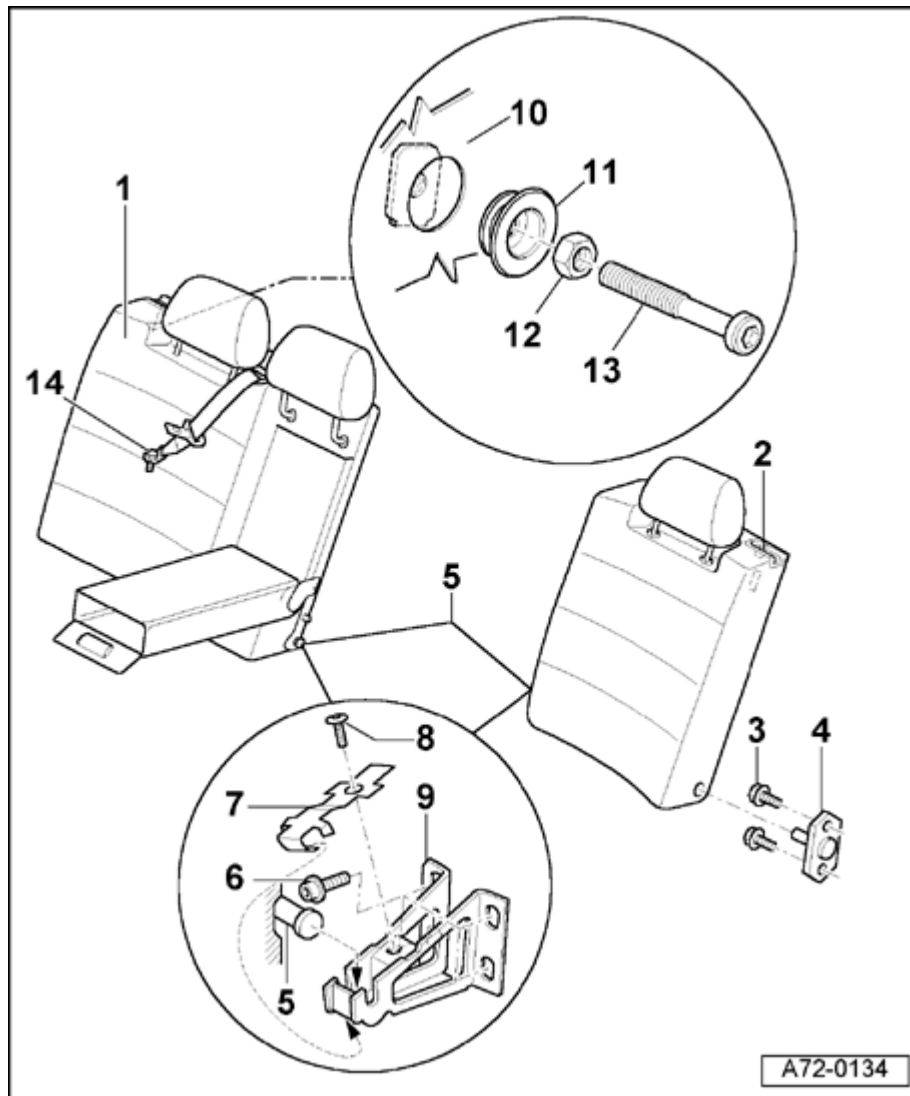
Installing:

- ◆ Installation is the reverse of removal

2 - 1/3 rear backrest

- Remove bolt -8- and remove center mounting bracket clip -7-.
- Lift rear backrest out of center mounting bracket -9- and pull toward center of car out of fitting -4-.

72-65

**3 - Bolts (2x)**

◆ 16 Nm (12 ft lb)

4 - Fitting**5 - Guide for rear backrest****6 - Bolt (4x)**

◆ 16 Nm (12 ft lb)

7 - Center mounting bracket clip**8 - Bolt**

◆ 8 Nm (71 in. lb)

9 - Center mounting bracket**10 - Side trunk trim****11 - Spring washer****12 - Nut**

◆ 55 Nm (41 ft lb)

13 - Latch bolt

- Install latch bolt hand tight and adjust after backrest is installed.

14 - Bolt (1x)

◆ 55 Nm (41 ft lb)

72-66

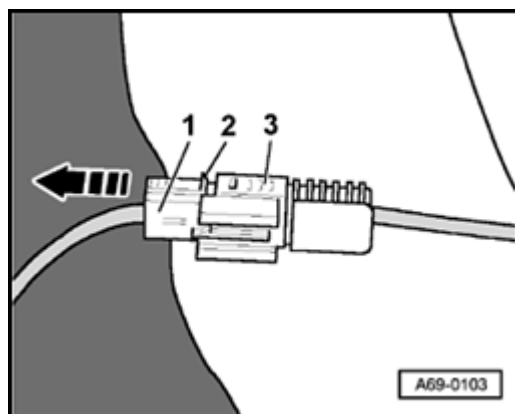
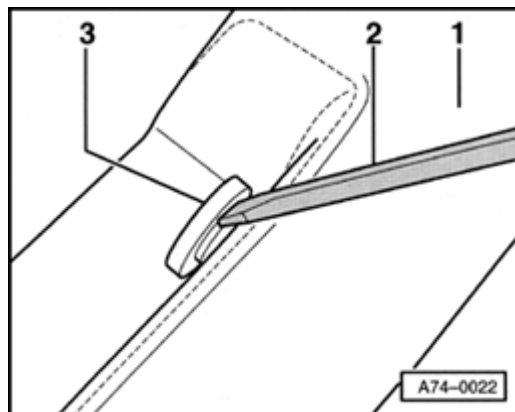


Fig. 2 Disconnecting harness connector for belt tensioner

- Press catches -2- and disconnect harness connector -1- in direction of arrow.

72-67

Headrest guide (one-piece rear backrest), removing and installing

**A**

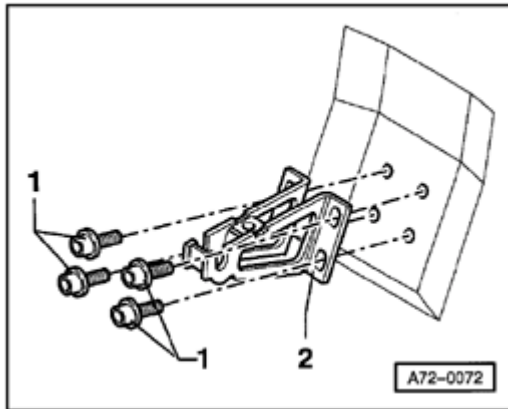
- Using screwdriver -2-, carefully lift headrest guide -3- out of rear backrest -1-.

Note:

Do not damage seat cover when removing headrest guide.

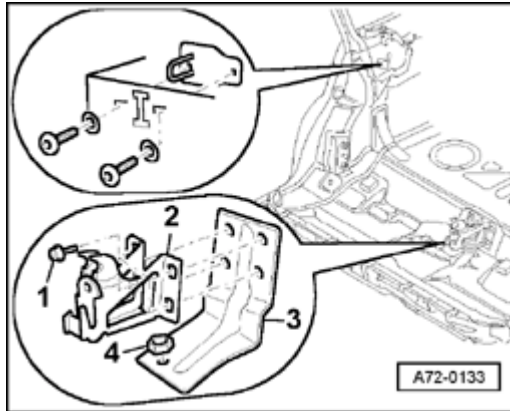
Center mounting bracket (Sedan and Avant m.y. 1998 ➤), removing and installing

- Remove left and right-rear backrests (Sedan) ⇒ [page 72-60](#) .
 - Remove left and right-rear backrests (Avant) ⇒ [page 72-64](#) .
 - Remove bolts -1- (4x) from center mounting bracket -2-.
- Tightening torque: 16 Nm (12 ft lb)



Center mounting bracket (Avant ➤ m.y. 1998), removing and installing

- Remove left and right-rear backrests ⇒ [page 72-62](#).



A

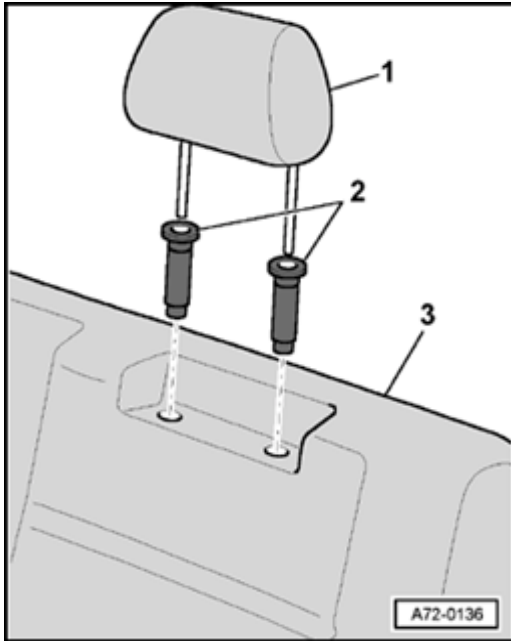
- Remove bolts -1- (4x) from center mounting bracket -2-.
Tightening torque: 16 Nm (12 ft lb)
- Center mounting bracket support -3- (only for vehicles with front wheel drive).
- Remove nut -4-.
Tightening torque: 5 Nm (44 in. lb)

72-70

Headrest, removing and installing

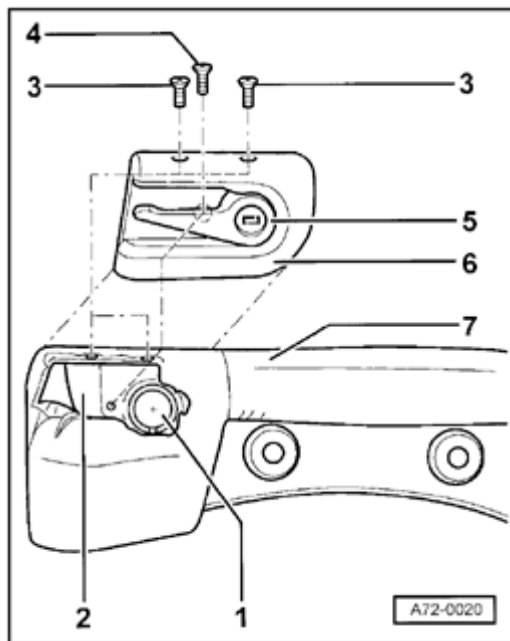
4

- Press button on left headrest guide -2-.
- Pull headrest -1- up and off of rear backrest -3-.



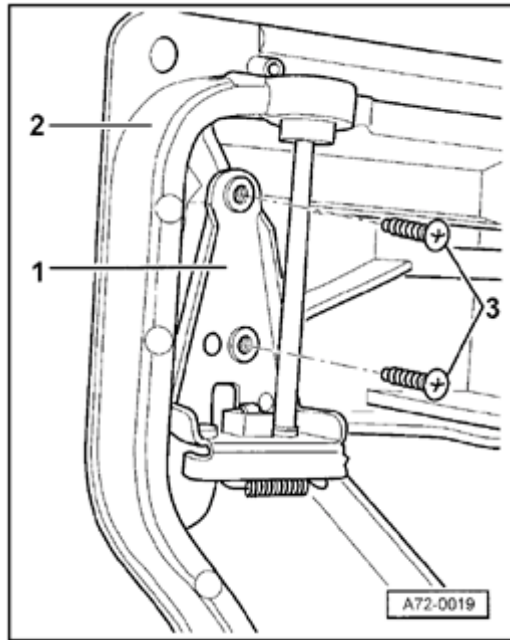
72-71

Lock for split rear backrest (Sedan and Avant ➤ m.y. 1998), removing and installing



- Remove screws -3- (2x).
- Push release lever -5- back and remove bolt -4-.
- Remove lock -6- from rear backrest -2-.
- When installing lock -6-, release lever -5- has to engage in groove for release -1-.

72-72



- Remove rear backrest upholstery in area near lock.

A

- Remove screws -3- (2x).

- Remove release -1- downward out of rear backrest.

Lock for split rear backrest (Avant m.y. 1998 ➤), removing

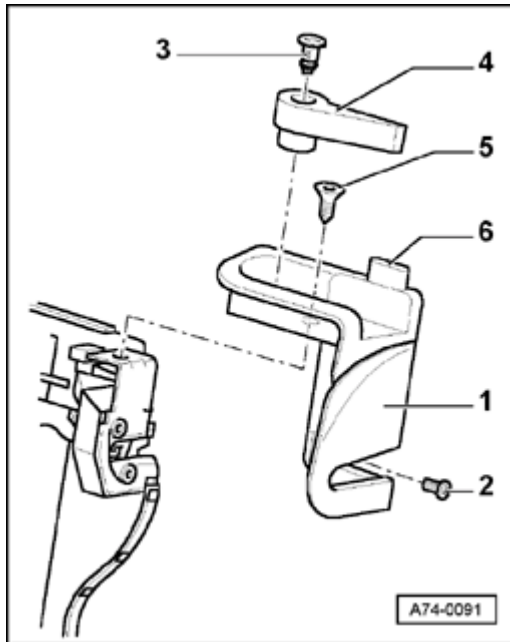
Removing lock trim

4

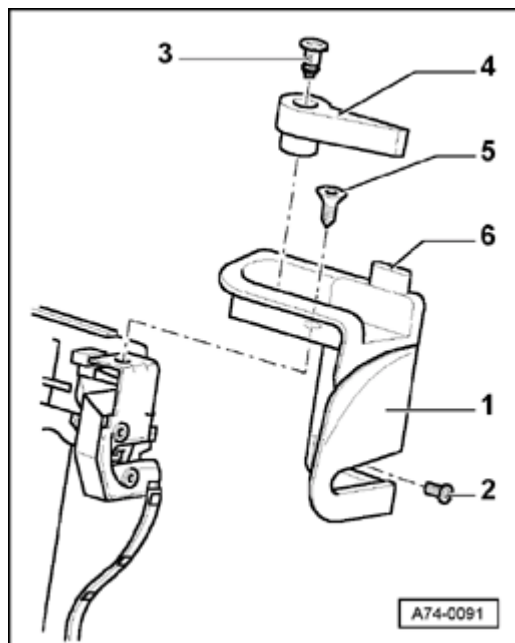
- Remove bolt -2-.
- Tightening torque: 1.5 Nm (13 in. lb)
- Remove bolt -5-.
- Tightening torque: 5 Nm (44 in. lb)
- Pull lock trim -1- up and remove.

Removing lock lever

- Lock trim removed
- Detach lock lever -4- from below from catches (2x).
- Lift up lock lever -4- using screwdriver.



72-74



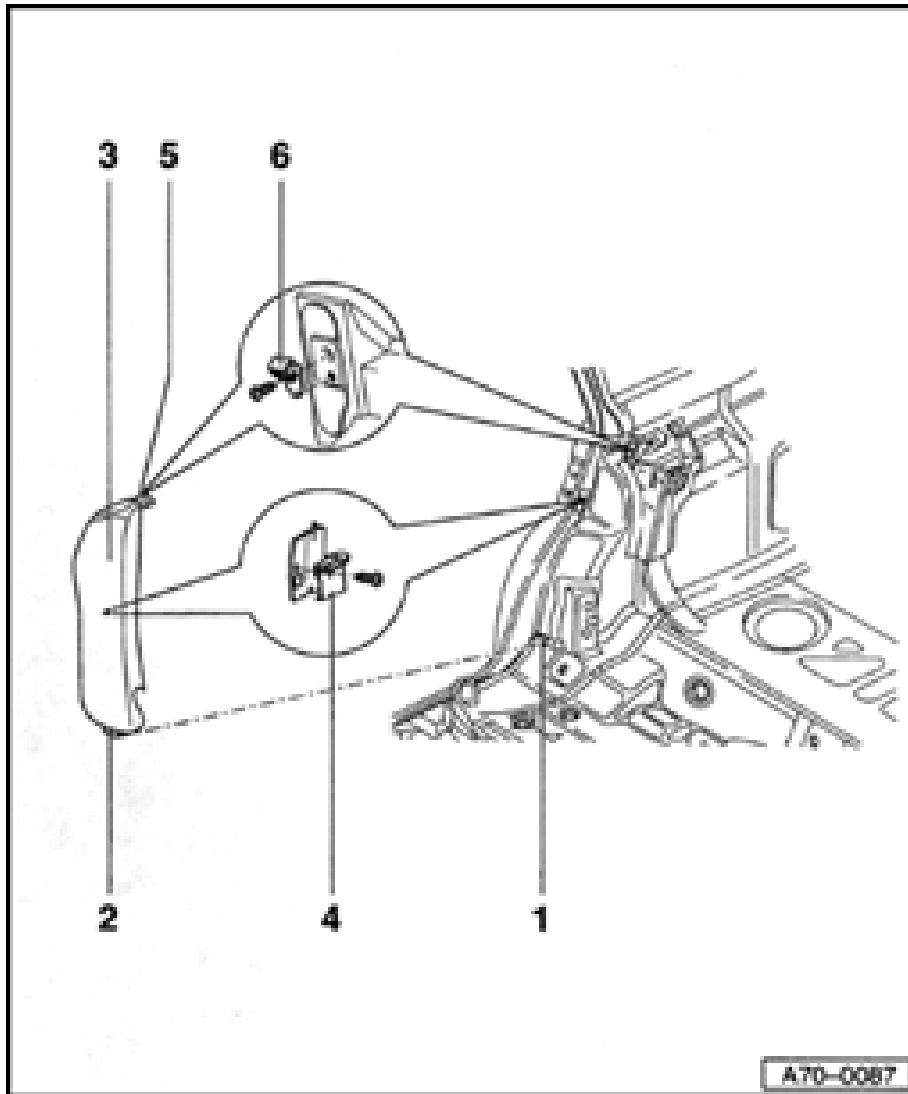
Removing locking cylinder

A

- Ignition key is required to remove and install locking cylinder -3-
- Locking lever -4- removed
- Using screwdriver, lift catches while simultaneously pressing out locking cylinder -3-.

Warning indicator

- ◆ When rear backrest is locked, pin -6- is 1-2 mm above lock trim.
- ◆ If rear backrest is not locked, pin -6- is approx. 20 mm above lock trim -1- and a red mark is visible.



Side bolster, removing and installing

1 - Metal tab

- Remove rear seat ⇒ [page 72-57](#) .
- Push backrest forward.
- Bend metal tab open and detach bracket -2-.

2 - Bracket

3 - Side bolster

4 - Hook

- Detach side bolster from hook.

5 - Bracket

6 - Mounting

- Push upper part of side bolster toward rear and detach bracket from mounting in upward direction.

Note:

When installing the side bolster, ensure that bracket -5- engages in retaining clip -6-, and that bolster frame -3- engages in hook -4- on door flange.

01-1

VAG1551 Scan Tool (ST), connecting

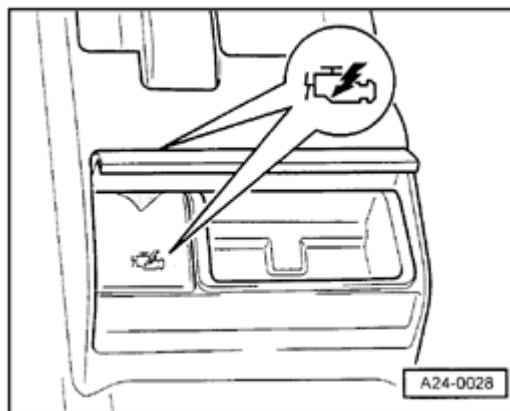
Note:

The VAG1552 mobile scan tool can be used instead of the VAG1551, but there is no print-out capability.

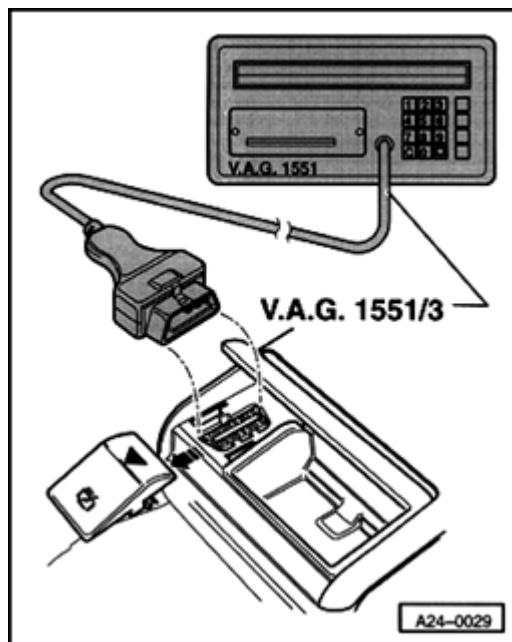
Requirements

- Battery Positive Voltage (B+) OK (at least 11 Volts)
- Engine and transmission Ground (GND) connections OK
- Fuse OK

01-2

Vehicles 1996

- A** - Open rear ash tray and remove Data Link Connector (DLC) cover.



- A** - Connect VAG1551 or VAG1552 Scan Tool (ST) with VAG1551/3 adapter to Data Link Connector (DLC).

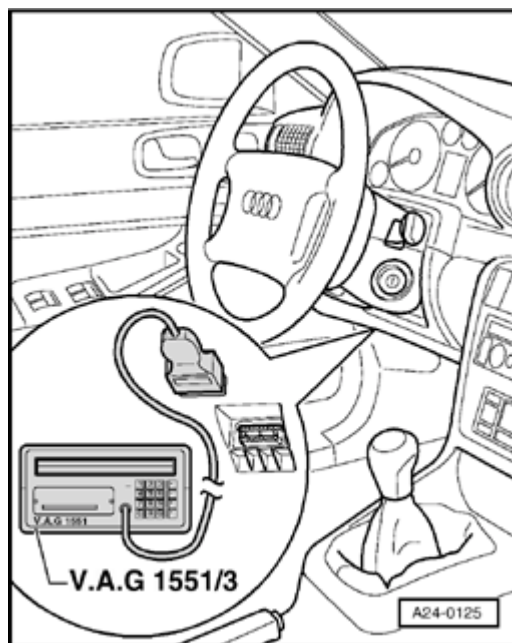
01-3

Vehicles 1997 ➤**Note:**

The DLC is located below the driver's knee bar to the left of the steering wheel.



- Connect VAG1551 or VAG1552 Scan Tool (ST) with VAG1551/3 adapter to Data Link Connector (DLC).

All vehicles**V.A.G - ON BOARD DIAGNOSTIC HELP**

- 1 - Rapid data transfer1)
- 2 - Blink Code Output1)



Indicated on display

- 1) Operating modes 1 and 2 are displayed alternately

If one of these messages is indicated on the display, perform On Board Diagnostic (OBD) according to OBD instructions:

Rapid data transfer **HELP**
Control module does not answer

⏮ Indicated on display
or

Rapid data transfer **HELP**
Error in communication link

⏮ Indicated on display

01-4

Rapid data transfer HELP
K wire not switching to Ground

Rapid data transfer HELP
K wire not switching to B+

Rapid data transfer HELP
Insert address word XX

or

➤ Indicated on display

or

➤ Indicated on display

- Check wiring connections for Data Link Connector (DLC).

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder*

Note:

If nothing appears on display:

⇒ *Scan tool operating instructions*

- Switch printer on by pressing PRINT button (indicator lamp in button lights up).
- Press button -1- to select "Rapid data transfer" operating mode 1.

➤ Indicated on display

Note:

After inserting "Automatic Test Sequence" address word 00 and pressing the -Q- button, an automatic test sequence is carried out (checks DTC memory for all systems with rapid data transfer capability).

01-5

Airbag system (with and without side airbag) On Board Diagnostic (OBD)

General Information

Vehicles ➤ 1997

The airbag system includes a driver-side airbag, passenger-side airbag, and two front seat belt tensioners. These are ignited centrally by the airbag control module -J234- if the specified activation criteria are met during a crash.

Vehicles 1997 ➤ 1999 : up to VIN 8D XA 200 000

The airbag system includes a driver-side airbag, passenger-side airbag, two front seat belt tensioners, side airbag, driver's side, side airbag, passenger side, and two or three (1998 and on) rear seat belt tensioners. If the specified activation criteria are met during a crash, they are ignited centrally by the airbag control module -J234-.

Regardless of the type of crash or crash intensity, the airbag control module sends a "crash signal" to the central locking control module. This function provides passive security. With the help of the central locking system, it unlocks the doors, opens the rear lid and blocks

interior switches when an airbag is triggered.
Also, interior lighting is switched on. The "crash
signal" can be checked using the Output
Diagnostic Test Mode ⇒ [page 01-44](#) .

1999 vehicles ➤: from VIN 8D XA 200 001

Airbag system includes: side airbag, passenger-side airbag, two front seat belt tensioners, two front side airbags, two or three rear seat belt tensioners and side curtain airbags. In a crash situation, these are ignited centrally by the airbag control module -J234- when specified triggering criteria are met.

In a crash situation, the control module sends a crash signal to the central locking control module. This function is a passive safety feature. It releases door locks and the rear lid lock via the central locking system if an airbag and/or belt tensioner is triggered. Also, inside door lock switches are blocked and interior lighting is switched on. The "crash signal" can be checked using output Diagnostic Test Mode (DTM) ⇒ [page 01-44](#) .

When the airbags and/or belt tensioners are deployed, the control module will record the DTC "Crash data stored."

Airbag control module -J234- must be replaced following:

- ◆ The 1st driver-side/passenger-side airbag deployment.
- ◆ The 3rd time front seat belt tensioners and/or

side airbags are triggered.

For vehicles with airbag 8 (➤10/98) the crash signal cannot be erased using the VAG1551 scan tool after the 3rd deployment.

All vehicles

The control module detects malfunctions and errors in the airbag system and stores them in permanent memory.

After the ignition is switched on, the airbag Malfunction Indicator Lamp (MIL) -K75- lights for about 4 seconds and then goes out.

- ◆ If the airbag Malfunction Indicator Lamp (MIL) - K75- does not go out after approximately 4 seconds, the voltage supply for the airbag control module -J234- is not OK. Check DTC memory ⇒ [page 01-11](#) .
- ◆ If the airbag Malfunction Indicator Lamp (MIL) - K75- goes out after 4 seconds and then lights again, either the control module is not coded, an incorrect control module has been installed or a malfunction is present. Check DTC memory ⇒ [page 01-11](#) .

CAUTION!

- ◆ **Wiring must only be checked visually!**
- ◆ **Do not perform an electrical continuity check or circuit analysis!**

♦ *Check wire routing only when ignition is switched off!*

Airbag system On Board Diagnostic (OBD), initiating

Requirements

- Power supply and fuses for relevant system OK

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder*

- VAG1551 Scan Tool (ST) connected ⇒ [page 01-1](#)
- Ignition switched on

Notes:

- ◆ *Malfunctions which have only occurred briefly are classified as "Sporadic malfunctions" and are identified by the "/SP" on the right side of the display.*
- ◆ *To eliminate these sporadic malfunctions, erase DTC memory before starting repair work.*
- ◆ *Additional operating instructions can be*

obtained by pressing the VAG1551 Scan Tool (ST) HELP button.

◆ *The → button is used to advance through the program sequence.*

- Switch printer on by pressing PRINT button (indicator lamp in button lights up).
- Press button -1- to select "Rapid data transfer" operating mode 1.

01-9

Rapid data transfer **HELP**
Insert address word XX

➤ Indicated on display

Address word for the airbag system: 15

- Press buttons -1- and -5- to insert "Airbag" address word 15.

Rapid data transfer **Q**
15 - Airbag

➤ Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer
Scan Tool sends address word 15

➤ Indicated on display

Vehicles ➤ 1997:

8A0959655D Airbag V AUDI D02 ➤
Coding 00766 WSC 06812

➤ Indicated on display after about 5 seconds

Vehicles 1997 ➤ up to 1999: VIN 8DXA 200 000

8D0959655C Airbag 7 AUDI D00 ➤
Coding 00102 WSC 06812

➤ - Indicated on display after approx. 5 seconds

Vehicles 1999 ➤: from VIN 8D XA 200 001

8D0959655J Airbag Front+Side 0004 ➤
Coding 01106 WSC 06812

➤ - Indicated on display after approx. 5 seconds:
Front and side airbag or front and side curtain airbag

All vehicles

- Press → button to advance through program sequence.



Indicated on display

Note:

A list of available functions is printed out when the HELP button is pressed.

On Board Diagnostic (OBD) functions

The following functions are possible:

01 - Check Control Module Versions ⇒ [page 01-41](#)

02 - Check DTC Memory ⇒ [page 01-11](#)

03 - Output Diagnostic Test Mode (vehicles 1997 ➤ 1998 only ⇒ [page 01-44](#)) (vehicles 1999 ➤ only ⇒ [page 01-46](#))

05 - Erase DTC Memory ⇒ [page 01-137](#)

06 - End Output ⇒ [page 01-139](#)

07 - Code Control Module ⇒ [page 01-51](#)

08 - Read Measuring Value Block ⇒ [page 01-57](#)

Note:

Rapid data transfer

HELP

Select function XX

Function 03 is only available for vehicles 1997 ➤.

Check DTC Memory (scan tool function 02)

Note:

The DTC display information is updated only when initiating the On Board Diagnostic (OBD) or "Erase DTC Memory" function 05.

- Switch printer on by pressing PRINT button (indicator lamp in button lights up).

Carrying out "Check DTC Memory" function 02

Rapid data transfer HELP
Select function XX

➤ Indicated on display

- Press buttons -0- and -2- to select "Check DTC Memory" function 02.

Rapid data transfer Q
02 - Check DTC Memory

➤ Indicated on display

- Press -Q- button to confirm input.

X DTC recognized ➡

➤ Indicated on display (number of stored Diagnostic Trouble Codes, DTCs).

or:

No DTC recognized ➡

➤ If the message "No DTC recognized" is displayed, the program can be returned to the starting point by pressing the ➡ button.

Rapid data transfer

HELP

Select function XX



Indicated on display

If something else is displayed:

⇒ *Scan tool operating instructions*

- Erase DTC Memory (function 05) ⇒ [page 01-137](#) .
- End Output (function 06) ⇒ [page 01-139](#) .
- Disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).

Diagnostic Trouble Code (DTC) table, airbag system

Notes:

- ◆ *In the following table, all the possible malfunctions that can be recognized by the airbag control module -J234- are listed according to their DTC code numbers. Existing malfunctions will be printed with their 5-digit DTC only if the VAG1551 printer is switched on.*
- ◆ *If a malfunction occurs persistently, the airbag Malfunction Indicator Lamp (MIL) -K75- will light up and remain lit until the malfunction is repaired and the DTC memory has been erased.*
- ◆ *If a malfunction occurs only occasionally or if the DTC memory is not erased after a malfunction is repaired, the malfunction will be displayed as a sporadic malfunction. Such malfunctions are identified by the letters "/SP" to the right on the VAG1551 display and will cause -K75- to light up continuously.*
- ◆ *Before replacing a component shown as malfunctioning, check the wiring to the component for short or open circuit according to the wiring diagram.*
- ◆ *The three digit malfunction type number appearing next to the DTC is a data code which can be disregarded.*

01-14

DTC VAG 1551 scan tool display	Possible cause	Corrective action
00532 Supply voltage B+ Supply voltage too low	◆ Battery discharged or faulty ◆ Short circuit in vehicle electrical system	- Recharge or replace battery. - Repair short circuit in vehicle electrical system.
00588 Airbag Igniter-Driver Side-N95 Resistance value too large	◆ Open circuit in wiring ◆ Spiral spring faulty ◆ Driver-side airbag unit faulty ◆ Airbag control module -J234-faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Check spiral spring. - Replace driver-side airbag unit. - Replace airbag control module -J234-.
00588 Airbag Igniter-Driver Side-N95 Resistance value too small	◆ Short circuit in wiring ◆ Spiral spring faulty ◆ Driver-side airbag unit faulty ◆ Airbag control module -J234-faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Check spiral spring.

		- Replace driver-side airbag unit. - Replace airbag control module -J234-.

01-15

DTC	Possible cause	Corrective action
VAG 1551 scan tool display		
00588 Drivers side airbag igniter -N95- Short circuit to B+	◆ Wire damaged ◆ Airbag control module -J234- malfunctioning	- Repair wiring according to wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace airbag control module -J234-
00588 Drivers side airbag igniter -N95- Short circuit to Ground	◆ Wire damaged ◆ Driver-side airbag unit malfunctioning ◆ Airbag control module -J234- malfunctioning	- Repair wiring according to wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace driver-side airbag unit - Replace airbag control module -J234-

01-16

DTC VAG 1551 scan tool display	Possible cause	Corrective action
00589 Airbag Igniter 1-Passenger Side-N131 Resistance value too large	◆ Open circuit in wiring ◆ Passenger-side airbag unit faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace passenger-side airbag unit. - Replace airbag control module -J234-.
00589 Airbag Igniter 1-Passenger Side-N131 Resistance value too small	◆ Short circuit in wiring ◆ Passenger-side airbag unit faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace passenger-side airbag unit. - Replace airbag control module -J234-.

01-17

DTC		
VAG 1551 scan tool display	Possible cause	Corrective action
00589 Passengers side airbag igniter 1 - N131- Short circuit to B+	◆ Wire damaged ◆ Airbag control module -J234- malfunctioning	- Repair wiring according to wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace airbag control module -J234-
00589 Passengers side airbag igniter 1 - N131- Short circuit to Ground	◆ Wire damaged ◆ Passenger-side airbag unit malfunctioning ◆ Airbag control module -J234- malfunctioning	- Repair wiring according to wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace passenger-side airbag unit - Replace airbag control module -J234-

01-18

V.A.G 1551 print-out	Possible malfunction cause	Corrective action
00589 Igniter 1 for airbag (passenger's side) -N131 Short to Ground	♦ Wiring damaged ♦ Front passenger's airbag unit faulty ♦ Airbag control unit -J234 faulty	- Repair per wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace front passenger's airbag unit - Replace airbag control unit -J234
00591 Left Seat Belt Switch -E24 Implausible switch condition	♦ Left belt lock switch faulty	- Replace left belt lock switch
00591 Left Seat Belt Switch -E24 Short circuit to positive	♦ Wiring damaged	- Check and repair wiring harness - Repair per wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>
00591 Left Seat Belt Switch -E24 Short circuit to Ground	♦ Wiring damaged	- Check and repair wiring harness - Repair per wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting &</i>

		<i>Component Locations binder</i>

01-19

V.A.G 1551 print-out	Possible malfunction cause	Corrective action
00592 Right Seat Belt Switch - E25 Implausible switch condition	♦ Right belt lock switch faulty	- Replace right belt lock switch
00592 Right Seat Belt Switch - E25 Short circuit to positive	♦ Wiring damaged	- Check and repair wiring harness - Repair per wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>
00592 Right Seat Belt Switch - E25 Short circuit to Ground	♦ Wiring damaged	- Check and repair wiring harness - Repair per wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>

01-20

DTC VAG 1551 scan tool display	Possible cause	Corrective action
00594 Airbag Ignition Circuit Short circuit to B+	◆ Wiring damaged ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace airbag control module -J234-.
00594 Airbag Ignition Circuit Short circuit to Ground	◆ Wiring damaged ◆ Spiral spring faulty ◆ Driver-side airbag faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Check spiral spring. - Replace driver-side airbag unit. - Replace airbag control module -J234-.
00595 Crash Data Stored	◆ Frontal collision ◆ Side collision	- Replace airbag control module, airbag units, seat belt tensioners and if necessary, faulty components.

01-21

DTC VAG 1551 scan tool display	Possible cause	Corrective action
00654 Seat Belt Tensioner Igniter,L-N153 Resistance value too large	◆ Open circuit in wiring ◆ Harness connector for left seat belt tensioner igniter disconnected ◆ Seat belt tensioner igniter faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Reconnect harness connector. - Replace left seat belt tensioner. - Replace airbag control module -J234-.
00654 Seat Belt Tensioner Igniter,L-N153 Resistance value too small	◆ Short circuit in wiring ◆ Left seat belt tensioner igniter faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace left seat belt tensioner. - Replace airbag control module -J234-.
00654 Seat Belt Tensioner Igniter,L-N153	◆ Wiring damaged ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting &</i>

Short circuit to B+	<i>Component Locations binder</i> - Replace airbag control module -J234-.

01-22

DTC VAG 1551 scan tool display	Possible cause	Corrective action
00654 Seat Belt Tensioner Igniter,L-N153 Short circuit to Ground	◆ Wiring damaged ◆ Left seat belt tensioner igniter faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace left seat belt tensioner. - Replace airbag control module -J234-.
00655 Seat Belt Tensioner Igniter,R-N154 Resistance value too large	◆ Open circuit in wiring ◆ Harness connector for right seat belt tensioner igniter disconnected ◆ Seat belt tensioner igniter faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Reconnect harness connector. - Replace right seat belt tensioner. - Replace airbag control module -J234-.

01-23

DTC VAG 1551 scan tool display	Possible cause	Corrective action
00655 Seat Belt Tensioner Igniter,R-N154 Resistance value too small	◆ Short circuit in wiring ◆ Right seat belt tensioner igniter faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace right seat belt tensioner. - Replace airbag control module -J234-.
00655 Seat Belt Tensioner Igniter,R-N154 Short circuit to B+	◆ Wiring damaged ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace airbag control module -J234-.
00655 Seat Belt Tensioner Igniter,R-N154 Short circuit to Ground	◆ Wiring damaged ◆ Right seat belt tensioner igniter faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace right seat belt tensioner.

		- Replace airbag control module -J234-.

01-24

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01044 Control Module incorrectly coded	◆ Control module incorrectly coded for vehicle configuration	- Code airbag control module -J234- appropriately.

01-25

Vehicles ➤ 1997:

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01025 Malfunction Indicator Lamp Faulty Open circuit to Ground	◆ Open circuit in wiring ◆ Airbag Malfunction Indicator lamp (MIL) -K75- ◆ Instrument cluster faulty ◆ Airbag control module -J234-faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Repair open circuit in wiring. - Replace Malfunction Indicator Lamp -K75-. - Repair instrument cluster. - Replace airbag control module -J234-.
01025 Malfunction Indicator Lamp Faulty Short circuit to Ground	◆ Wiring damaged ◆ Airbag Malfunction Indicator lamp (MIL) -K75- ◆ Instrument cluster faulty ◆ Airbag control module -J234-faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace Malfunction Indicator Lamp -K75-. - Repair instrument cluster. - Replace airbag control module -J234-.

01-26

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01025 Malfunction Indicator Lamp Faulty Short circuit to B+	◆ Wiring damaged ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace airbag control module -J234-.

01-27

Vehicles 1997 ➤ :

DTC	Possible cause	Corrective action
VAG 1551 scan tool display		
01211 Igniter for Belt Tens., Rr., Driver-N196 (sensor for lateral acceleration) Resistance value too large	◆ Wiring damaged ◆ Seat belt tensioner igniter -N196- faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N196-. - Replace airbag control module -J234-.
01211 Igniter for Belt Tens., Rr., Driver-N196 Resistance value too small	◆ Wiring damaged ◆ Seat belt tensioner igniter -N196- faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N196-. - Replace airbag control module -J234-.

01-28

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01211 Igniter for Belt Tens., Rr., Driver-N196 Short circuit to B+	◆ Wiring damaged ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace airbag control module -J234-.
01211 Igniter for Belt Tens., Rr., Driver-N196 Short circuit to Ground	◆ Wiring damaged ◆ Seat belt tensioner igniter - N196- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N196-. - Replace airbag control module -J234-.
01211 Igniter for Belt Tens., Rr., Driver-N196 Open circuit	◆ Wiring damaged ◆ Seat belt tensioner igniter - N196- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N196-.

		- Replace airbag control module -J234-.

01-29

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01212 Igniter for Belt Tens., Rr., Pass.-N197 Resistance value too large	◆ Wiring damaged ◆ Seat belt tensioner igniter - N197- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N197-. - Replace airbag control module -J234-.
01212 Igniter for Belt Tens., Rr., Pass.-N197 Resistance value too small	◆ Wiring damaged ◆ Seat belt tensioner igniter - N197- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N197-. - Replace airbag control module -J234-.
01212 Igniter for Belt Tens., Rr., Pass.-N197 Short circuit to B+	◆ Wiring damaged ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>

		- Replace airbag control module -J234-.

01-30

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01212 Igniter for Belt Tens., Rr., Pass.-N197 Short circuit to Ground	◆ Wiring damaged ◆ Seat belt tensioner igniter - N197- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N197-. - Replace airbag control module -J234-.
01212 Igniter for Belt Tens., Rr., Pass.-N197 Open circuit	◆ Wiring damaged ◆ Seat belt tensioner igniter - N197- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N197-. - Replace airbag control module -J234-.

01-31

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01213 Igniter for Belt Tens., Rr., Ctr.-N198 Resistance value too large	◆ Wiring damaged ◆ Seat belt tensioner igniter - N198- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N198-. - Replace airbag control module -J234-.
01213 Igniter for Belt Tens., Rr., Ctr.-N198 Resistance value too small	◆ Wiring damaged ◆ Seat belt tensioner igniter - N198- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N198-. - Replace airbag control module -J234-.
01213 Igniter for Belt Tens., Rr., Ctr.-N198 Short circuit to B+	◆ Wiring damaged ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>

		- Replace airbag control module -J234-.

01-32

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01213 Igniter for Belt Tens., Rr., Ctr.-N198 Short circuit to Ground	◆ Wiring damaged ◆ Seat belt tensioner igniter - N198- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N198-. - Replace airbag control module -J234-.
01213 Igniter for Belt Tens., Rr., Ctr.-N198 Open circuit	◆ Wiring damaged ◆ Seat belt tensioner igniter - N198- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace seat belt tensioner igniter -N198-. - Replace airbag control module -J234-.

01-33

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01217 Side Airbag Igniter, Driver's Side-N199 Resistance value too large	◆ Open circuit in wiring ◆ Side airbag unit, driver's side faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace side airbag unit, driver's side. - Replace airbag control module -J234-
01217 Side Airbag Igniter, Driver's Side-N199 Resistance value too small	◆ Short circuit in wiring ◆ Side airbag, driver's side faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace side airbag, driver's side - Replace airbag control module -J234-.
01217 Side Airbag Igniter, Driver's Side-N199 Short circuit to B+	◆ Wiring damaged ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>

		- Replace airbag control module -J234-.

01-34

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01217 Side Airbag Igniter, Driver's Side-N199 Short circuit to Ground	◆ Wiring damaged ◆ Side airbag, driver's side faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace side airbag, driver's side. - Replace airbag control module -J234-.
01218 Side Airbag Igniter, Pass. Side-N200 Resistance value too large	◆ Open circuit in wiring ◆ Side airbag, passenger side faulty ◆ Airbag control module - J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace side airbag, passenger side. - Replace airbag control module -J234-.
01218 Side Airbag Igniter, Pass. Side-N200 Resistance value too small	◆ Short circuit in wiring ◆ Side airbag, passenger side faulty ◆ Airbag control module -	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>

	J234- faulty	- Replace side airbag, passenger side. - Replace airbag control module -J234-.

01-35

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01218 Side Airbag Igniter, Pass. Side-N200 Short circuit to B+	◆ Wiring damaged ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace airbag control module -J234-.
01218 Side Airbag Igniter, Pass. Side-N200 Short circuit to Ground	◆ Wiring damaged ◆ Side airbag, passenger side faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace side airbag, passenger side. - Replace airbag control module -J234-.
01221 Crash Sens. Side Airbag Driv. Side-G179 (sensor for lateral acceleration)	◆ Open circuit in wiring ◆ Harness connector for crash sensor	- Repair wiring according to wiring diagram.

Open circuit	for side airbag, driver's side disconnected ◆ Crash sensor for side airbag, driver's side -G179 faulty ◆ Airbag control module -J234- faulty	⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Reconnect harness connector. - Replace crash sensor -G179-. - Replace airbag control module -J234-.

01-36

DTC		
VAG 1551 scan tool display	Possible cause	Corrective action
01221 Crash Sens. Side Airbag Driv. Side-G179 (sensor for lateral acceleration) Short circuit	◆ Short circuit in wiring to B+ or Ground ◆ Crash sensor for side airbag, driver's side -G179 faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace crash sensor -G179-. - Replace airbag control module -J234-.
01221 Crash Sens. Side Airbag Driv. Side-G179 (sensor for lateral acceleration) Not authorized	◆ Airbag control module -J234- incorrectly coded ◆ Control module and crash sensor do not match	- Replace control module -J234-. - Replace crash sensor -G179-.
01222 Crash Sens. Side Airbag Pass. Side-G180 (sensor for lateral acceleration) Open circuit	◆ Open circuit in wiring ◆ Harness connector for crash sensor for side airbag, passenger side disconnected ◆ Crash sensor for side airbag, passenger side -G180- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>

	◆ Airbag control module -J234- faulty	- Reconnect harness connector. - Replace crash sensor -G180-. - Replace airbag control module -J234-.

01-37

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01222 Crash Sens. Side Airbag Pass. Side-G180 (sensor for lateral acceleration) Short circuit	◆ Short circuit in wiring to B+ or Ground ◆ Crash sensor for side airbag, passenger side -G180- faulty ◆ Airbag control module -J234- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace crash sensor -G180-. - Replace airbag control module -J234-.
01222 Crash Sens. Side Airbag Pass. Side-G180 (sensor for lateral acceleration) Not authorized	◆ Airbag control module -J234- incorrectly coded ◆ Control module and crash sensor do not match	- Replace control module -J234-. - Replace crash sensor -G180-.
01223 Signal Open Central Locking	◆ Airbag control module -J234- faulty	- Replace airbag control module -J234-.
01280 1) Airbag Passenger Side Switched Off	◆ Passenger-side airbag was switched off during adaptation	- Adapt airbag control module -J234- as appropriate.

01-38

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01578 Wng.Light for Airbag Off,Pass. Side-K145 Short circuit to B+	◆ Wiring damaged ◆ Airbag control module -J234-faulty	- Repair wiring according to wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace airbag control module -J234-
01578 Wng.Light for Airbag Off,Pass. Side-K145 Open/Short circuit to ground	◆ Wiring damaged ◆ Warning light for airbag off, passenger side -K145- faulty ◆ Airbag control module -J234-faulty	- Repair wiring according to wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace warning light -K145- - Replace airbag control module -J234-
01588 Ign. for Side Curtain Airbag, Driver Side-N251Resistance value too large	◆ Open circuit in wiring ◆ Driver-side side curtain airbag faulty ◆ Airbag control module faulty	- Repair open circuit. - Replace driver-side side curtain airbag. - Replace airbag control module -J234-.

1) Only airbag 7 (from 07.96 on) and airbag 8. The DTC is stored in memory even if the airbag control module -J134- has been adapted appropriately.

01-39

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01588 Ign. for Side curtain airbag, Driver Side-N251Resistance vaule too small	◆ Short circuit in wiring ◆ Driver-side side curtain airbag faulty ◆ Airbag control module faulty	- Repair short circuit. - Replace driver-side side curtain airbag. - Replace airbag control module -J234-.
01588 Ign. for Side curtain Airbag, Driver Side-N251Short circuit to B+	◆ Wiring damaged ◆ Airbag control module faulty	- Repair damaged wiring. - Replace airbag control module -J234-.
01588 Ign. for Side curtain Airbag, Driver Side-N251Short circuit to Ground	◆ Wiring damaged ◆ Driver-side side curtain airbag faulty ◆ Airbag control module faulty	- Repair damaged wiring. - Replace driver-side side curtain airbag. - Replace airbag control module -J234-.
01589 Igniter for Airbag Pass. Side-N252Resistance value too large	◆ Open circuit in wiring ◆ Passenger-side side curtain	- Repair open circuit. - Replace passenger-side side

	airbag faulty ♦ Airbag control module faulty	curtain airbag. - Replace airbag control module -J234-.
01589 Igniter for Airbag Pass. Side-N252Resistance vaule too small	♦ Short circuit in wiring ♦ Passenger-side side curtain airbag faulty ♦ Airbag control module faulty	- Repair short circuit. - Replace passenger-side side curtain airbag. - Replace airbag control module -J234-.

01-40

DTC	Possible cause	Corrective action
VAG 1551 scan tool display		
01589 Igniter for Airbag Pass. Side-N252Short circuit to B+	◆ Wiring damaged ◆ Airbag control module faulty	- Repair damaged wiring. - Replace airbag control module - J234-.
01589 Igniter for Airbag Pass. Side-N252Short circuit to Ground	◆ Wiring damaged ◆ Passenger-side side curtain airbag faulty ◆ Airbag control module faulty	- Repair damaged wiring. - Replace passenger-side side curtain airbag. - Replace airbag control module - J234-.
65535 Control Module Malfunctioning		- Replace airbag control module - J234-.

Note:

DTC 65535 "Control Module Malfunctioning" cannot be erased using the VAG1551 Scan Tool (ST).

01-41

Check Control Module Versions (scan tool function 01)

- Press buttons -0- and -1- to select "Check Control Module Versions" function 01.

Rapid data transfer Q
01 - Check Control Module Versions

➤ Indicated on display

- Press -Q- button to confirm input.

Vehicles ➤ 1997

8A0959655D Airbag V AUDI D02 ➡
Coding 00766 WSC 06812

➤ Indicated on display after about 5 seconds

Explanation of display

- ◆ 8A0959655D: Part No. of airbag control module
- ◆ Airbag V AUDI: airbag system designation
- ◆ D02: software version of control module for airbag in Audi vehicles
- ◆ Coding 00766: coding for airbag control module. Code Control Module table ⇒ [page 01-52](#) .
- ◆ WSC 06812: dealership number
- Press ➡ button to return to "Select function XX" prompt.

Rapid data transfer HELP
Select function XX

➤ Indicated on display

Vehicles 1997 ➤ 1999: up to VIN 8D XA 200 000

➤ Indicated on display after about 5 seconds

Explanation of display

- ◆ 8D0959655D: Part No. of airbag control module (front and side airbags)
 - ◆ 8D0959655M: Part No. of airbag control module (front and side airbags)
 - ◆ Airbag 7: airbag system designation
 - ◆ AUDI D00: software version of control modules for Audi vehicles (control module identification No. can also be a 4 digit number)
 - ◆ Coding 00102: coding for airbag control module. Code Control Module table ⇒ [page 01-53](#)
 - ◆ WSC 06812: dealership number
- Press ➡ button to return to "Select function XX" prompt.

➤ Indicated on display

8D0959655C	Airbag 7	AUDI D00 ➡
Coding 00102	WSC 06812	

Rapid data transfer	HELP
Select function XX	

Vehicles 1999 ➤: from VIN 8D XA 200 001

8D0959655K Airbag Front+Side D004 ➡
Coding 01106 WSC 06812



- Indicated on display after approx. 5 seconds:

Explanation of display

- ◆ 8D0959655K: Part No. of airbag control module (front and side airbags)
- ◆ 8D0959655G: Part No. of airbag control module (front and side curtain airbags)
- ◆ Airbag front + side: component identification for airbag system

Note:

For vehicles with Airbag 8, display will indicate airbag front + side or airbag front + side curtain in place of Airbag V, Airbag 7.

- ◆ D004: software version of control module for airbag in Audi vehicles
- ◆ Coding 01106: coding of airbag control module. Coding table ⇒ [page 01-54](#)
- ◆ WSC 06812: dealership number
- Press ➡ button to return to "Select function XX" prompt.

Rapid data transfer HELP
Select function XX



Indicated on display

Output Diagnostic Test Mode (scan tool function 03) (vehicles 1997 ➤ 1998)

The Output Diagnostic Test Mode is used to check operation of the crash response system. When airbags are triggered, the central locking system unlocks the doors and simultaneously blocks internal switches. Emergency flashers and interior lights are switched on.

Notes:

Before initiating the Output Diagnostic Test Mode, switch central locking system to "closed" by operating internal switch.

Carrying out "Output Diagnostic Test Mode" function 03

Rapid data transfer **HELP**
Select function XX



Indicated on display

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode" function 03.

Rapid data transfer **Q**
03 - Output Diagnostic Test Mode



Indicated on display

- Press -Q- button to confirm input.

Output Diagnostic Test Mode 
Signal: Open central locking system



Indicated on display

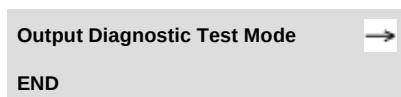
The central locking system must switch to "open."

Emergency flashers and interior lights switch on.

- Operate internal switch.

Central locking must switch back to "closed."

01-45



◀ Indicated on display

- Press → button.



◀ Indicated on display

Output Diagnostic Test Mode (scan tool function 03) (vehicles 1999 ➤)

Vehicles up to calendar week (KW) 18.99

Output Diagnostic Test Mode (DTM) is used to check the operation of the crash response system. When airbags are triggered, the central locking system switches immediately to "open" and the inside door lock switches are blocked. Emergency flashers and interior lights are switched on.

Notes:

- ◆ *Before initiating output Diagnostic Test Mode (DTM), set the central locking system to "closed" by operating the interior switch.*
- ◆ *Set interior switch to "door contact" position.*
- ◆ *After output DTM is initiated, central locking cannot be operated until the DTC memory of the central locking control module is erased.*

Carrying out "Output Diagnostic Test Mode" (function 03)



Indicated on display

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode"

Rapid data transfer

HELP

Select function XX

function 03 and press -Q- button to confirm input.

01-47

Output Diagnostic Test Mode 

Signal: Open central locking system



Indicated on display

Central locking must switch to "open."

Emergency flashers and interior lights switch on.

- Operate interior switch. Central locking must not switch to "closed" as long as DTC is still stored in central locking control module.

Notes:

- ◆ After this procedure step, DTC 01366 is stored in the DTC memory of the central locking control module.
- ◆ After completion of output Diagnostic Test Mode (DTM), the DTC memory of the central locking control module must be checked and this DTC must be erased ⇒ [page 01-74](#) .

Output Diagnostic Test Mode 

END



Indicated on display

- Press  button.

Rapid data transfer HELP

Select function XX



Indicated on display

Vehicles from calendar week (KW) 18.99 on

Output Diagnostic Test Mode (DTM) is used to check the operation of the crash response system. When airbags are triggered, the central locking system switches immediately to "open" and the inside door lock switches are blocked. Emergency flashers and interior lights are switched on and the fuel supply is interrupted.

Notes:

- ◆ *Before initiating output Diagnostic Test Mode (DTM), set the central locking system to "closed" by operating the interior switch and start the engine.*
- ◆ *Set interior light switch to "door contact" position.*
- ◆ *After output DTM is initiated, central locking cannot be operated until the DTC memory of the central locking control module is erased.*

Carrying out "Output Diagnostic Test Mode" (function 03)

Indicated on display

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode" function 03.

Rapid data transfer

HELP

Select function XX

Rapid data transfer



03 -Output Diagnostic Test Mode



Indicated on display

- Press -Q- button to confirm input.

Output Diagnostic Test Mode



Signal: Open central locking system



Indicated on display

Engine must stop running

Central locking must switch to "open."

Emergency flashers and interior lights switch on.

- Operate interior switch. Central locking must not switch to "closed" as long as DTC is still stored in central locking control module.

Notes:

- ◆ After this procedure step, DTC 01366 is stored in the DTC memory of the central locking control module.
- ◆ After completion of output Diagnostic Test Mode (DTM), the DTC memory of the central locking control module must be checked and this DTC must be erased ⇒ [page 01-74](#) .
- ◆ Several DTCs will be stored in the DTC memory of the Engine Control Module (ECM) after this procedure.
- ◆ After completing output Diagnostic Test Mode (DTM), the DTC memory of the Engine Control Module (ECM) must be checked and erased. This procedure varies depending on the fuel injection and ignition system installed in the vehicle. Refer to Repair Group 01 of the appropriate repair manual ⇒ DTC memory, checking and erasing.
- ◆ Depending on engine type, fuel shut-off is a running-change as of KW 18.99.

01-50

◆ If engine does not stop running, check if fuel shut-off was accomplished in Engine Control Module (ECM).

⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations binder

◆ If engine does not stop running, but fuel shut-off was accomplished in the Engine Control Module (ECM), check wire to Engine Control Module (ECM).

⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations binder

Output Diagnostic Test Mode



END



Indicated on display

- Press → button.

Rapid data transfer

HELP

Select function XX



Indicated on display

Code Control Module (scan tool function 07)

Notes:

- ◆ *Control modules are supplied uncoded.*
- ◆ *An uncoded control module will cause the airbag Malfunction Indicator Lamp (MIL) -K75- to light up continuously.*
- ◆ *The coding procedure is carried out using the VAG1551 Scan Tool (ST).*

If no coding appears on the VAG1551 Scan Tool (ST), or if a new control module has been installed, carry out the coding procedure as follows:

01-52

Carrying out "Code Control Module" function 07

Rapid data transfer **HELP**
Select function XX



Indicated on display

- Press buttons -0- and -7- to select "Code Control Module" function 07.

Rapid data transfer **Q**
07 - Code Control Module



Indicated on display

- Press -Q- button to confirm input.

Code Control Module
Enter code number XXXXX (0-32000)



Indicated on display

- Enter coding for airbag control module using keypad:

Vehicles ➤ 1997:

Coding table for airbag control module

System variation	Coding
Driver and passenger-side airbag active, both belt tensioners active	00127

01-53

Vehicles 1997 ➤ 1999 up to VIN 8D XA 200 000:

Coding table for airbag control module

System variation	Coding
Vehicles with front airbags, front side airbags and front belt tensioner	00102
Vehicles with front airbags, front side airbags, front belt tensioner and 2 rear belt tensioners	00104
Vehicles with front airbags, front side airbags, front belt tensioner and 3 rear belt tensioners	00106
Vehicles with front airbags, and front belt tensioners	00002
Vehicles with front airbags, front belt tensioners and 2 rear belt tensioners	00004
Vehicles with front airbags, front belt tensioners and 3 rear belt tensioners	00006

01-54

Vehicles 1999 ➤: from VIN 8D XA 200 001 on

Coding table for airbag control module

Airbag system		Coding
Airbag 8	Vehicles with front airbags, front side airbags, front seat belt tensioners, two rear seat belt tensioners	00104
Airbag 8	Vehicles with front airbags, front side airbags, front seat belt tensioners, three rear seat belt tensioners	00106
Airbag 8	Vehicles with front airbags, front side airbags, front seat belt tensioners, side curtain airbags two rear seat belt tensioners	00304
Airbag 8	Vehicles with front airbags, front side airbags, front seat belt tensioners, side curtain airbags three rear seat belt tensioners	00306

Code Control Module **Q**
Enter code number 00104 (0-32000)



Indicated on display (e.g. 00104)

- Press -Q- button to confirm input.

8D0959655K Airbag Front+Side D00 ➡
Coding 00104 WSC 06812



- Indicated on display (control module identification will appear on display together with coding that has been entered, e.g. 00104).

01-55

- Press → button.

Rapid data transfer HELP
Select function XX

↩ Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.

Rapid data transfer Q
06 - End Output

↩ Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer HELP
Input address word XX

↩ Indicated on display

01-56

Code Control Module	Q
Enter code number 00102	(0-32000)

8D0959655C	Airbag 7	AUDI D00	→
Coding 00102	WSC 06812		

Rapid data transfer	HELP
Select function XX	

Rapid data transfer	Q
06 - End Output	

Rapid data transfer	Help
Insert address word XX	

All vehicles:

Indicated on display (e.g. 00102):

- Press -Q- button to confirm input.



- Display indicates control module identification with coding input (e.g. 00102).

Notes:

- ◆ Coding 00102, 00104 and 00106 can only be used for control module number "8D0959655D" or "8D0959655M."

- ◆ Explanation of display ⇒ [page 01-41](#) .

- Push → button.



Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.
This ends the function.



Indicated on display

- Press -Q- button to confirm input.



Indicated on display

Read Measuring Value Block (scan tool function 08)

Note:

The current airbag system condition can be determined by using the "Read Measuring Value Block" function 08.

Carrying out "Read Measuring Value Block" function 08

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08.

Rapid data transfer Q
08 - Read Measuring Value Block



Indicated on display

- Press -Q- button to confirm input.

Read Measuring Value Block
Input display group number XXX



Indicated on display

- Press buttons -0-, -0- and -1- to input display group number 1 (001).
- Press -Q- button to confirm input.

Central locking On Board Diagnostic (OBD)

General Information

The new generation of central locking is capable of On Board Diagnostic. Use of DTC memory, Output Diagnostic Test Mode and Read Measuring Value Block facilitates the search for malfunctions. The central locking system variation can also be coded using the VAG1551 Scan Tool (ST).

Central locking has two pneumatic circuits. For central locking without keyless entry, the first circuit controls only the fuel filler flap; for central locking with the keyless entry system, the first circuit controls both the fuel filler flap and the driver-side door. The second circuit controls all remaining locking points.

On the safety-version of central locking, if the driver-side (or passenger-side door) is unlocked with a single command, then only that door and the first pneumatic circuit are opened. If there is another unlocking command within 5 seconds, the second pneumatic circuit is also triggered and the whole vehicle is unlocked.

If the rear lock cylinder is triggered only once, all doors will remain locked. The rear lid (or tailgate) will automatically re-lock itself after about 5 seconds.

Interior lighting will gradually increase in intensity until fully illuminated (within about 1.5 seconds) when unlocking (fades off when locking).

The control of the luggage compartment lighting proceeds from the central locking pump to the rear lid (or tailgate) contact switch. The lighting will be switched off while the rear lid is open when a certain speed threshold is surpassed (about 5 km/h) or after 10 minutes.

The new remote transmitter now uses radio frequency. For vehicles using the radio frequency remote locking system, the receiver is integrated into the central locking pump. The remote locking antenna is integrated into the wiring harness.

If no doors (or the rear lid) have been opened within 60 seconds after the central locking system is triggered via radio frequency, central locking automatically relocks everything.

If the anti-theft alarm system is armed, central locking cannot be opened via internal buttons.

All vehicles with an anti-theft system are equipped with an ultrasonic interior monitoring system. This could be an interior monitor of the 1st generation (without OBD) or of the 2nd generation (with OBD). All that is necessary is the proper coding of the central locking system
⇒ [page 01-91](#) .

Confirmation can be received from central locking as to whether the alarm system has been armed while locking the doors. The confirmation can be signalled by means of a short anti-theft

horn signal or by a brief flashing of the emergency flashers. Central locking can also be coded to give no confirmation at all.

Activation of keyless entry can be signalled by a flashing of the emergency flashers.

Central Locking On Board Diagnostic (OBD), initiating

Requirements

- Power supply and fuses for relevant system OK

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder*

- VAG1551 Scan Tool (ST) connected ⇒ [page 01-1](#)

Notes:

- ◆ *If the display remains blank, check VAG1551 voltage supply according to wiring diagram,*
- ◆ *The Scan Tool (ST) HELP button can provide additional operating instruction.*
- ◆ *The → button is used to advance through the program sequence.*
- ◆ *If an incorrect entry is made, press the -C- button to escape.*

- Switch printer on by pressing PRINT button (indicator lamp in button lights up).
- Press button -1- to select "Rapid data transfer" operating mode 1.

Rapid data transfer

HELP

Insert address word XX



Indicated on display

01-72

Address word for central locking: 35

- Press buttons -3- and -5- to insert "Central Locking" address word 35.

Rapid data transfer Q
35 - Central Locking



Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer
Scan Tool sends address word 35



Indicated on display

Vehicles ➤ 1997:

8L0862257B CL-Pump, DWA, Func D04 
Coding 12172 WSC 06812



After about 5 seconds, display indicates (for example):

Vehicles 1998 ➤:

8L0862257B CL-Pump, DWA, Func D04 
Coding 16140 WSC 06812



After about 5 seconds, display indicates (for example):

All vehicles:

- Press ➡ button.

Rapid data transfer HELP
Select function XX



Indicated on display

Note:

A list of available functions is printed out when the HELP button is pressed.

On Board Diagnostic (OBD) functions

The following functions are possible:

01 - Check Control Module Versions ⇒ [page 01-85](#) .

02 - Check DTC Memory ⇒ [page 01-74](#) .

03 - Output Diagnostic Test Mode ⇒ [page 01-88](#) .

05 - Erase DTC Memory ⇒ [page 01-137](#) .

06 - End Output ⇒ [page 01-139](#) .

07 - Code Control Module ⇒ [page 01-91](#) .

08 - Read Measuring Value Block ⇒ [page 01-99](#) .

Check DTC Memory (scan tool function 02)

Note:

The DTC display information is updated only when initiating the On Board Diagnostic (OBD) program or when using the "Erase DTC Memory" function 05.

- Switch printer on by pressing PRINT button (indicator lamp in button lights up).

Carrying out "Check DTC Memory" function 02

Rapid data transfer HELP
Select function XX

◀ Indicated on display

- Press buttons -0- and -2- to select "Check DTC Memory" function 02.

Rapid data transfer Q
02 - Check DTC Memory

◀ Indicated on display

- Press -Q- button to confirm input.

X DTC recognized →

◀ The number of stored DTCs is indicated on display.

The stored malfunctions are displayed and printed out in sequence.

- Look up printed malfunctions in the DTC table and repair all malfunctions ⇒ [page 01-76](#) .

No DTC recognized



Rapid data transfer

HELP

Select function XX



If the message "No DTC recognized" is displayed, the program can be returned to the starting point by pressing the → button.



Indicated on display

If something else is displayed:

⇒ *Scan tool operating instructions*

- Erase DTC Memory (function 05) ⇒ [page 01-137](#) .
- End Output (function 06) ⇒ [page 01-139](#) .
- Disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).

Diagnostic Trouble Code (DTC) table, central locking

Notes:

- ◆ *The following table lists all the DTCs that can be recognized by the control module for central locking and printed out by the VAG1551 Scan Tool (ST). The DTCs are listed in order according to their 5-digit numbers.*
- ◆ *DTC 5-digit numbers appear only on the print-out from the scan tool.*
- ◆ *Before replacing a component shown as malfunctioning, check wiring and connections to the component as well as the Ground (GND) connections according to the relevant wiring diagram.*
- ◆ *When a repair has been completed, check and then erase DTC memory using the VAG1551 Scan Tool (ST). After that, the vehicle should be locked again (with key or remote control) and DTC memory checked again.*
- ◆ *DTC memory records all static and sporadic malfunctions. When a malfunction occurs, it is first identified as a static malfunction. If it does not occur again it is registered as a sporadic malfunction, and the letters "/SP" appear at the right of the display.*
- ◆ *When the ignition is switched on, all existing malfunctions are automatically re-classified as sporadic malfunctions and will only be registered as static malfunctions if they still occur after testing.*
- ◆ *Sporadic malfunctions which no longer occur after 50 driving cycles are erased automatically.*
- ◆ *The three digit malfunction type number appearing next to the DTC is a data code which may be disregarded.*

01-77

DTC VAG 1551 scan tool display	Possible cause	Corrective action
00955 Key 1 Adaptation limit exceeded	◆ Key not matched ◆ Key operated more than 200 times while out of range	- Perform remote transmitter coding procedure ⇒ page 01-105
00956 Key 2 Adaptation limit exceeded	◆ Key not matched ◆ Key operated more than 200 times while out of range	- Perform remote transmitter coding procedure ⇒ page 01-105
00957 Key 3 Adaptation limit exceeded	◆ Key not matched ◆ Key operated more than 200 times while out of range	- Perform remote transmitter coding procedure ⇒ page 01-105
00958 Key 4 Adaptation limit exceeded	◆ Key not matched ◆ Key operated more than 200 times while out of range	- Perform remote transmitter coding procedure ⇒ page 01-105
00991 Interior lighting		

Short circuit to positive	◆ Short circuit to in wiring	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>

01-78

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01360 Open ATW Switch Short circuit to Ground	♦ Short circuit to Ground in wiring 1) ♦ Door contact switch, driver's-side - F2- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Check -F2- and replace if necessary.
01361 Close ATW Switch Short circuit to Ground	♦ Short circuit to Ground in wiring 1) ♦ Door contact switch, driver's-side - F2- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Check -F2- and replace if necessary.
01362 Close Switch for Tailgate-F124 Short circuit to Ground	♦ Short circuit to Ground in wiring 1) ♦ Trunk lock alarm/central locking switch -F124- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i> - Check -F124- and replace if necessary.

1) A malfunction is stored if the Ground is connected for more than 1 min. (e.g. due to an incorrect operation of central locking). Only initiate a repair if there is a proper complaint, otherwise erase DTC memory ⇒ [page 01-137](#) .

01-79

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01363 Switch for CL; Drivers Door-F59 Incorrect Signal	♦ This indication can be caused by the system itself. There is no malfunction of driver's door central locking system switch -F59-.	- Ignore DTC and erase DTC memory ⇒ page 01-137 .
01364 Switch for CL; Passenger Door-F114 Incorrect Signal	♦ This indication can be caused by the system itself. There is no malfunction of passenger door central locking system switch -F114-.	- Ignore DTC and erase DTC memory ⇒ page 01-137 .
01365 Lock/Unlock Switch/Button Int. Short circuit to Ground	♦ Short circuit to Ground in wiring 1) ♦ Switch for interior lock, driver's side -E150- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Check -E150- and replace if necessary.
1) A malfunction is stored if the Ground is connected for more than 1 min. (e.g. due to an incorrect operation of central locking). Only initiate a repair if there is a proper complaint, otherwise erase DTC memory ⇒ page 01-137 .		

01-80

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01365 Lock/Unlock Switch/Button Int. Short circuit to B+	◆ Short circuit Short circuit to Ground in wiring ◆ Switch for interior lock, driver's side -E150- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Check -E150- and replace if necessary.
01366 Open Via Crash Signal Short circuit to Ground Open/short circuit to B+	◆ Output Diagnostic Test Mode performed at airbag control module -J234- ◆ Airbag control module -J234- was triggered ◆ Short circuit in wiring between airbag control module and central locking control module	- Erase DTC memory ⇒ page 01-137 . - Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>
01367 Switch on Via CL Pump	◆ Too little pressure in pneumatic lines ◆ Central locking pump faulty	- Check pneumatic lines for leaks. - Exchange central locking pump. - Check all actuators of central locking system and replace if necessary.

01-81

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01368 Alarm Via Luggage Compartment Switch	◆ Anti-theft system triggered by unauthorized opening of rear lid ◆ Trunk lid alarm switch -F123- faulty	- Erase DTC memory. - Replace -F123-.
01369 Alarm Via Front Hood Switch	◆ Anti-theft system triggered by unauthorized opening of hood ◆ Hood alarm switch -F120- faulty	- Erase DTC memory. - Replace -F120-.
01370 Alarm Via Interior Scanning Short circuit to Ground	◆ Anti-theft system triggered by control module for ultra-sound sensors -J347- ◆ Control module for ultra-sound sensors -J347- faulty ◆ Short circuit in wiring between control module for ultra-sound sensors and central locking control module	- Erase DTC memory. - On Board Diagnostic (OBD) ultra-sound interior monitoring ⇒ page 01-108 . - Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>
01371 Alarm Via Door Contact		

Switch Driv. Side	◆ Anti-theft system triggered by unauthorized opening of driver-side door ◆ Door contact switch, driver's side -F2- faulty	- Erase DTC memory. - Replace door contact switch -F2-.

01-82

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01372 Alarm Via Door Ctact. Switch Rear PS	◆ Anti-theft system triggered by unauthorized opening of passenger-side and/or rear door(s) ◆ Door contact switches -F3-, -F10-, -F11- faulty	- Erase DTC memory. - Replace contact switch -F3-, -F10-, -F11-.
01373 Alarm Via Radio Ground Teminal	◆ Anti-theft system triggered by unauthorized removal of radio ◆ Ground connection for anti-theft system has an open circuit	- Erase DTC memory. - Provide Ground connection.
01374 Alarm Via Terminal 15	◆ Anti-theft system triggered by unauthorized starting (short circuiting) ◆ Short circuit between terminal 30 and 15	- Erase DTC memory. - Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i>

01-83

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01384 Alarm via Broken Glass Sensor (rear window)	◆ Anti-theft alarm triggered by attempted break-in at rear window ◆ Open in rear window defroster circuit ◆ False alarm	- Erase DTC memory - Check and repair wiring and connectors per wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace rear window ⇒ Repair Manual, Body Exterior, Repair Group 64
01389 Tailgate Open Switch-F124 Short circuit to Ground	◆ Short circuit to Ground in wiring ◆ Trunk lock alarm/central locking switch - F124- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace -F124- in trunk lock.

01-84

DTC	Possible cause	Corrective action
VAG 1551 scan tool display		
01403 Broken Glass Sensors Broken glass sensor for rear left side window -G183 or Broken glass sensor for rear right side window -G184	◆ Anti-theft alarm triggered by attempted break-in at one of the side windows ◆ Open in circuit of one of the side windows ◆ False alarm	- Erase DTC memory - Check and repair wiring and connectors per wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace side window as necessary ⇒ Repair Manual, Body Exterior, Repair Group 64
65535 Control Module Malfunctioning		- Replace control module.

01-85

Check Control Module Versions (scan tool function 01)

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -1- to select "Check Control Module Versions" function 01.

Rapid data transfer Q
01 - Check Control Module Versions



Indicated on display

- Press -Q- button to confirm input.

Vehicles ➤ 1997

8L0862257B CL-Pump, DWA, Func D04 →
Coding 12172 WSC 06812



Indicated on display

Explanation of display

- ◆ 8L0862257B: Part No. of central locking control modules
- ◆ Central locking pump, Anti-theft system: component identification
- ◆ D04: software version
- ◆ Coding 12172: coding ⇒ [page 01-91](#)
- ◆ WSC 06812: dealership number
- Press → button

Vehicles 1998 ➤

Indicated on display

Explanation of display

- ◆ 8L0862257B: Part No. of central locking control modules
 - ◆ Central locking pump, Anti-theft system: component identification
 - ◆ D04: software version
 - ◆ Coding 16140: coding ⇒ [page 01-91](#)
 - ◆ WSC 06812: dealership number
- Press ➡ button

8L0862257BCL-Pump, DWA, Func D04 ➡
Coding 16140 WSC 06812

01-87

All vehicles:

If one of these messages is indicated on the display, perform On Board Diagnostic (OBD) according to OBD instructions:

Rapid data transfer HELP
Control module does not answer

⚡ Indicated on display
or

Rapid data transfer HELP
Error in communication link

⚡ Indicated on display
or

Rapid data transfer HELP
K wire not switching to Ground

⚡ Indicated on display
or

Rapid data transfer HELP
K wire not switching to B+

⚡ Indicated on display

- Check wiring connections for Data Link Connector (DLC).

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder*

Note:

If nothing appears on display:

⇒ *Scan tool operating instructions*

Rapid data transfer HELP

⚡ Indicated on display

Select function XX

Output Diagnostic Test Mode (scan tool function 03)

Notes:

- ◆ *The Output Diagnostic Test Mode may only be performed with the vehicle stationary and the engine not running.*
- ◆ *Any malfunctions identified by the Output Diagnostic Test Mode must be checked and repaired.*

The output DTM activates the following elements in sequence:

- ◆ Emergency flashers and anti-theft horn (only for vehicles equipped with anti-theft system)
- ◆ Interior monitoring (activated even if interior monitoring is not installed)
- ◆ Emergency flashers and interior lights as a test of the crash signal

01-89

Carrying out "Output Diagnostic Test Mode" function 03

Rapid data transfer **HELP**
Select function XX

⏮ Indicated on display

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode" function 03.

Rapid data transfer **Q**
03 - Output Diagnostic Test Mode

⏮ Indicated on display

- Press -Q- button to confirm input.

Output Diagnostic Test Mode →
Create active alarm

⏮ Indicated on display (emergency flasher and anti-theft horn are activated)

- Press → button.

Output Diagnostic Test Mode →
Next final ctrl: operate →

⏮ Indicated on display

- Press → button.

Output Diagnostic Test Mode →
Activate interior monitoring

⏮ Indicated on display (central locking control module sends a signal which activates interior monitoring system)

Notes:

- ◆ After activating interior monitoring, a system dependant waiting time of 30 seconds must be maintained.
- ◆ If one alarm is activated, an entry into DTC memory of the control module for central locking will be made "1370; alarm via interior monitoring" as well as into control module for ultra-sound sensors "alarm via sensor for anti-theft warning system; fl, fr, rl, rr".

- ◆ *Malfunctions must be checked and erased in DTC memory of the respective control module.*

01-90

Output Diagnostic Test Mode	→
Next final ctrl:	operate →

Output Diagnostic Test Mode	→
Simulate crash signal	

- Press → button.

↩ Indicated on display

- Press → button.

↩ Indicated on display (emergency flashers and interior lights are triggered)

- Press → button.

Notes:

- ◆ The malfunction "1366; opening via crash-signal" is stored in DTC memory of the control module for central locking.
- ◆ Output Diagnostic Test Mode (DTM) must be repeated with airbag control module. After performing output Diagnostic Test Mode (DTM) of airbag control module, DTC "01366 opening via crash signal" will also be stored in control module for central locking.
- ◆ The malfunction must be checked in DTC memory of the control module for central locking ⇒ [page 01-74](#) and erased ⇒ [page 01-137](#).

Output Diagnostic Test Mode	→
END	

↩ Indicated on display

- Press → button.

The program is now back at its starting point.

Rapid data transfer	HELP
Select function XX	

↩ Indicated on display

Code Control Module (scan tool function 07)

With coding, different central locking variations can be enabled for possible function/equipment variations.

Central locking variations:

- ◆ Central locking with anti-theft system
- ◆ Central locking with remote control and anti-theft system

Notes:

- ◆ *The basic functions of the central locking system are listed in a standard code table ⇒ [page 01-93](#) .*
- ◆ *Further coding variations are possible at the request of the customer ⇒ [page 01-94](#) .*

Carrying out "Code Control Module" function 07



Indicated on display

- Press buttons -0- and -7- to select "Code Control Module" function 07.

Rapid data transfer

HELP

Select function XX

Rapid data transfer Q
07 - Code Control Module



Indicated on display

- Press -Q- button to confirm input.

Code Control Module
Enter code number XXXXX (0-32000)



Indicated on display

01-92

- Input coding of the central locking control module with keypad (e.g. 16140 for central locking with anti-theft/remote) vehicles1998 ➤.

Code Control Module Q
Enter code number 16140 (0-32000)

⏪ Indicated on display

- Press -Q- button to confirm input.

8L0862257N CL pump, DWA, Func D12 ➡
Coding 16140 WSC 06812

⏪ - Indicated on display (control module identification with current coding)

Note:

Explanation of display ⇒ [page 01-85](#) .

- Press ➡ button

Rapid data transfer HELP
Select function XX

⏪ Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.

Rapid data transfer Q
06 - End Output

⏪ Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer HELP
Insert address word XX

⏪ Indicated on display

01-93

Standard code table**Vehicles ➤ 1997 (with Delta radio):**

Vehicle type	Central locking variation	Standard coding
Audi A4	◆ Vehicle with central locking and anti-theft system	03468
	◆ Vehicle with central locking, anti-theft system and keyless entry	12172

Vehicles 1998 ➤ (with Concert radio):

Vehicle type	Central locking variation	Standard coding
Audi A4	◆ Vehicle with central locking and anti-theft system	03340
	◆ Vehicle with central locking, anti-theft system and keyless entry	16140

01-94

All vehicles:

In addition to basic coding, it is possible to offer customers the following option:

- ◆ Vehicle automatically locks upon reaching a speed of about 15 km/h (10 mph) and unlocks when the key is removed from the ignition

Optional code table**Vehicles ➤ 1997 (with Delta radio):**

Vehicle type	Central locking variation	Optional coding
Audi A4	◆ Vehicle with central locking and anti-theft system	03500
	◆ Vehicle with central locking, anti-theft system and keyless entry	12204

Vehicles 1998 ➤ (with Concert radio):

Vehicle type	Central locking variation	Optional coding
Audi A4	◆ Vehicle with central locking and anti-theft system	03372
	◆ Vehicle with central locking, anti-theft system and keyless entry	16172

Notes:

Safety central locking (SCL) has the following functions (when vehicle is unlocked):

- ◆ *If central locking is activated only once (with key or keyless entry), the driver-side door and the fuel filler flap are unlocked, while all other doors and the rear lid remain locked.*
- ◆ *If central locking is immediately activated a second time, the remaining doors and the rear lid are unlocked.*

01-96

Standard coding table for vehicles (tailgate with soft-touch) 1999 ➤ :

Vehicle type	Central locking version	Standard coding
Audi A4	◆ Vehicles with central locking	00001
	◆ Vehicles with central locking and anti-theft warning system	00267
	◆ Vehicles with central locking and radio-frequency remote control	12865
	◆ Vehicles with central locking, anti-theft warning system and radio-frequency remote control	13131

Note:***Coding for vehicles which have tailgates equipped with soft-touch, incorporates:***

During mechanical unlocking (via tailgate lock), the tailgate unlocks and opens. In this way, the tailgate can be opened without operating soft-touch.

01-97

Standard coding table for vehicles 18.00 ➤ :

Vehicle type	Central locking version	Standard coding
Audi A4	◆ Vehicles with central locking	02049
	◆ Vehicles with central locking and anti-theft warning system	02315
	◆ Vehicles with central locking and radio-frequency remote control	14913
	◆ Vehicles with central locking, anti-theft warning system and radio-frequency remote control	15179

Notes:**Coding for vehicles from cw 18.00 incorporates:**

- ◆ *Changed door or window regulator logic. As soon as the door is opened with "terminal. 15 off" the window regulators can no longer be operated.*
- ◆ *During mechanical unlocking (via tailgate lock), the tailgate unlocks and opens. In this way, the tailgate can be opened without operating soft-touch.*

All vehicles:

Beside the basic coding, it is possible to offer the customer the following additional functions:

To activate the following additional functions, the following number value must be added to the respective basic coding.

◆ Safety central locking (SCL)	+ 4
◆ Automatic locking of the vehicle at a speed of approx. 15 km/h	+ 32 (with SCL + 36)

The value 4 for SCL and 32 for automatic locking above a speed must be added to the current coding.

e.g. CL-pump with ATS/remote and SCL (15179 + 4 = 15183).

Notes:

- ◆ *Safety central locking (SCL) has the following function (vehicle locked):*
- ◆ *If the CL is only operated once (via key or remote control), the drivers door and the tank flap will be unlocked while all other doors and*

tailgate remain locked.

- ◆ *If the CL is immediately operated for a second time, the remaining doors and tailgate will also be unlocked.*

Read Measuring Value Block (scan tool function 08)

Note:

The current system condition can be determined by using "Read Measuring Value Block" function 08.

Carrying out "Read Measuring Value Block" function 08

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08.

Rapid data transfer Q
08 - Read Measuring Value Block



Indicated on display

- Press -Q- button to confirm input.

Read Measuring Value Block
Input display group number XXX



Indicated on display

- Press buttons -0-, -0- and -1- to input display group number 1 (001).
- Press -Q- button to confirm input.

The selected measuring value block is now indicated in standard format.

Read Measuring Value Block, overview

Display group 001

Read Measuring Value Block 1				→	◀ Indicated on display
0100	100	0000	0000		
			X		• Rear lid: 1 = opened, 0 = closed
			X		• Luggage compartment light: 1 = light on, 0 = light off
			X		• Switch for unlocking rear lid (A8 only): 1 = activated, 0 = not activated
			X		• Motor for unlocking rear lid (A8 only): 1 = motor running, 0 = motor not running
		XX			• Actuator switch or internal switch at passenger-side door: 00 = not activated, 01 = lock, 10 = unlock, 11 = not permissible
		XX			• Actuator switch or internal switch at driver-side door: 00 = not activated, 01 = lock, 10 = unlock, 11 = not permissible
	X				• Passenger-side door and rear doors: 1 = open, 0 = closed (USA: only rear doors)
	X				• Driver-side door: 1 = open, 0 = closed (USA: driver-side and passenger-side doors)
	X				• Hood: 1 = open, 0 = closed
	Position of key in lock cylinder				

X	• Opening driver-side and passenger-side doors: 1 = key activated, 0 = key in middle position
X	• Closing driver-side and passenger-side doors: 1 = key activated, 0 = key in middle position
X	• Opening rear lid: 1 = key activated, 0 = key in middle position
X	• Closing rear lid: 1 = key activated, 0 = key in middle position

01-101

Display group 002

Read Measuring Value Block 2



◀ Indicated on display

0100

1000

111

X

- Terminal 15: 1 = Ignition on, 0 = Ignition off

X

- S-contact: 1 = S-contact on, 0 = S-contact off

X

- Ground signal from radio: 0 = Radio installed, 1 = Radio removed

X

- Remote transmitter button "open": 1 = activated, 0 = not activated

X

- Remote transmitter button "close": 1 = activated, 0 = not activated

X

- Remote transmitter button open "rear lid" (A8 only): 1 = activated, 0 = not activated

X

- Remote transmitter button "panic" (USA only): 1 = activated, 0 = not activated

X

- Interior light controls: 1 = interior light on, 0 = interior light off

X

- Control wire for window regulator/sunroof:
1 = Terminal 87 (maintaining voltage supply), 0 = Ground

- Function "comfort close:" 1 = comfort close activated, 0 = not activated

X

- Function "comfort open:" 1 = comfort open activated, 0 = not activated

X

01-102

Display group 003

Read Measuring Value Block 3



◀ Indicated on display

0

0001

0

0000

X

- Remote transmitter button "open": 2)
1 = activated, 0 = not activated

X

- Remote transmitter button "close": 2)
1 = activated, 0 = not activated

X

- Remote transmitter button open "rear lid" (N/A): 2)
1 = activated, 0 = not activated

X

- Remote transmitter button "Panic" (N/A): 2)
1 = activated, 0 = not activated

X

- Disregard measuring value

X

- Keyless entry key memory position 4 1): 1 = position occupied, 0 = not occupied

X

- Keyless entry key memory position 3 1): 1 = position occupied, 0 = not occupied

X

- Keyless entry key memory position 2 1): 1 = position occupied, 0 = not occupied

X

- Keyless entry key memory position 1 1): 1 = position occupied, 0 = not occupied

X

- Disregard measuring value

- 1) When you activate keyless entry, the relevant keyless entry key memory position blinks.
- 2) This measuring value block also shows non-coded keyless entry keys (e.g. for function control of keyless entry).

01-103

Display group 004 (vehicles up to software version D04)

Read Measuring Value Block 4			→	◀ Indicated on display
100	1011	1100	1100	
			X	• Anti-theft system activated: 0 = no, 1 = yes
			X	• Safety central locking: 0 = no, 1 = yes
			X	• Disregard measuring value: coding always 0
			X	
		X		• Anti-theft system activated: 0 = no, 1 = yes
		X		• Interior monitoring system is OBD capable: 0 = yes, 1 = no
		X		• Locking vehicle above a speed: 0 = yes, 1 = no
		X		• Vehicle is a convertible: 0 = no, 1 = yes
	X			• USA-Door logic 1) activated: 0 = no, 1 = yes
	X			• Confirmation of anti-theft system via emergency flashers: 0 = no, 1 = yes
	X			• Confirmation of anti-theft system via horn: 0 = no, 1 = yes
	X			• Confirmation of keyless entry via emergency flashers: 0 = no, 1 = yes
X				• Remote transmitter activated: 0 = no, 1 = yes

X	• Activation of security central locking also possible with remote transmitter: 0 = no, 1 = yes
X	• Comfort closing also possible with remote transmitter: 0 = no, 1 = yes

1) Window regulators will not work if ignition is off and driver-side door is open.

01-104

Display group 004 (vehicles from software version D05)

Simpo PDF Merge and Split Unregistered Version - http://www.simpopdf.com

Read measuring value block 4				→ ◀ Indicated on display
100	1111	1000	1100	
			X	• Anti-theft warning system activated: 0 = No, 1 = Yes
			X	• Safety-CL activated: 0 = No, 1 = Yes
			X	• Confirmation of anti-theft warning system via emergency flashers: 0 = No, 1 = Yes
			X	• Tailgate opening, lock cylinder rear: 0 = No, 1 = Yes
		X		• Anti-theft warning system activated: 0 = No, 1 = Yes
		X		• Interior monitoring is OBD capable: 0 = Yes, 1 = No
		X		• Locking vehicle above a speed: 0 = No, 1 = Yes
		X		• Vehicle is a Cabrio: 0 = No, 1 = Yes
	X			• USA-door logic 1) activated: 0 = No, 1 = Yes
	X			• Confirmation of radio-frequency remote control button "open" via emergency flashers: 0 = No, 1 = Yes
	X			• Confirmation of anti-theft warning system via ATS horn: 0 = No, 1 = Yes
				Confirmation of radio-frequency remote control button "lock" via emergency flashers:

X	• 0 = No, 1 = Yes
X	• Radio-frequency remote control activated: 0 = No, 1 = Yes
X	• For safety central locking selection, CL-function for operation via radio frequency remote, otherwise SCL-function: 0 = No, 1 = Yes
X	• Comfort locking/ -unlocking also possible via radio-frequency remote control: 0 = No, 1 = Yes

- 1) All window regulators are not functional, if the ignition is switched off and the drivers door is open at the same time.

Remote transmitter, coding

Two remote transmitters are supplied with the vehicle. If further transmitters are required, they must be coded to interact properly with the central locking control module.

This procedure must be performed after changing the batteries in keys with remote control function, or if the scan tool displays DTCs of 00955 to 00958

Remote transmitter coding procedure

- Switch ignition on (using separate key).
- Check how many transmitters have already been coded in measuring value block 003 ⇒ [Read Measuring Value Block page 01-99](#) .

Read Measuring Value Block 3			
0	0001	0	0000



Indicated on display

Display field 2 indicates how many remote transmitters have been coded and in which memory positions (in the example given, 1 transmitter in position 1).

- Lock vehicle from outside using key to be coded via driver-side door lock.
- Press "unlock" button within 5 seconds often enough to reach next memory position (in example given, twice).

Every press of the button is confirmed by the emergency flashers and the anti-theft system horn.

- Wait 5 seconds.

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- Now press "unlock" button one more time (vehicle unlocks).
- Switch ignition off and remove ignition key.
- Check function of new transmitter.
- Check display field 2 in measuring value block 003. It should now display another "1" (in example given: 1100).

Note:

Be sure that new transmitters are always coded into free memory positions. If occupied positions (distinguishable by a "1") are used, the transmitter previously coded to this position will no longer work.

Existing remote transmitter recoding procedure

This procedure must be performed after changing the batteries in keys with remote control function, or if the scan tool displays DTCs of 00955 to 00958

- Press any button on transmitter.

If vehicle does not respond by locking or

unlocking:

- Lock and unlock vehicle within 30 seconds using driver-side lock.
- Now check function of recoded remote transmitter.

Clearing memory positions

Note:

It is possible to clear all memory positions, e.g. if a customer loses a remote transmitter. Proceed as follows:

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- Switch ignition on using key.
- Then mechanically lock central locking from outside vehicle using key.
- Activate remote transmitter "unlock" button on key five times at one second intervals. A short horn signal will sound each time.
- Then, after 6 seconds, press remote transmitter "unlock" button to confirm this clearing procedure one more time.

Central locking should no longer unlock itself via remote transmitter.

- Switch ignition off.

Up to four transmitters can now be coded again.

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Ultrasonic interior monitoring On Board Diagnostic (OBD)

General Information

The ultrasonic interior monitoring system is only offered in conjunction with the anti-theft system.

The security provided by the anti-theft system is enhanced through addition of the ultrasonic interior monitoring option.

Interior monitoring activates the anti-theft alarm when unauthorized attempts are made to enter the vehicle through the side windows.

Function

The ultrasonic interior monitoring system consists of:

- ◆ Control module for ultra-sound sensors - J347-
- ◆ Ultra-sound sensor, left for anti-theft warning system -G170-
- ◆ Ultra-sound sensor, right for anti-theft warning system -G171-

- ◆ Sensor for broken window glass rear left -G183-
(only for Avant)
- ◆ Sensor for broken window glass rear right -
G184- (only for Avant)
- ◆ Switch for passenger compartment monitoring -
E183-

The ultra-sound sensors in the right and left upper B-pillar trims monitor the side windows and send the monitoring signal to the control module for ultra-sound sensors.

If the monitoring signal deviates from the norm, the control module for interior monitoring activates the alarm via the control module for the anti-theft system.

In addition to the contact switches in the lock units, glass break sensors in side windows as well as the conductor loop in rear window, (only for Avant), serve for securing the exterior of the vehicle.

The control module for interior monitoring activates the warning lamps next to the door locking buttons. These warning lamps provide further information regarding the interior monitoring system.

⇒ *Repair Manual, Electrical Equipment*

Interior monitoring can be manually shut off for the duration of a door closing via the switch for interior monitoring.

⇒ *Owner's Manual*

The ultrasonic interior monitoring system is capable of extensive On Board Diagnostic (OBD). If malfunctions in component parts develop, DTCs are stored in the DTC memory of the control module. Malfunctions can then be identified using the VAG1551 or VAG1552 scan tools.

Ultrasonic interior monitoring On Board Diagnostic (OBD), initiating

Requirements

- Fuse OK according to wiring diagram
- VAG1551 Scan Tool (ST) connected ⇒ [page 01-1](#)
- Anti-theft system not armed

Notes:

- ◆ *If the display remains blank, check VAG1551 voltage supply according to wiring diagram.*
- ◆ *The scan tool HELP button can provide additional operating instructions.*
- ◆ *The → button is used to advance through the program sequence.*
- ◆ *If an incorrect entry is made, press the -C- button to escape.*

01-111

- Switch ignition on.
- Switch printer on by pressing PRINT button (indicator lamp in button lights up).
- Press button -1- to select "Rapid data transfer" operating mode 1.

Rapid data transfer HELP
Insert address word XX

➤ Indicated on display

Address word for interior monitoring: 45

- Press buttons -4- and -5- to insert "Int. Monitoring" address word 45.

Rapid data transfer Q
45 - Int. Monitoring

➤ Indicated on display

- Press -Q- button to confirm input.

4B0951173 Int. Monitoring D00 ➡
Coding 00101 WSC 06812

➤ Indicated on display after about 5 seconds

- Press ➡ button.

Note:

A list of available functions is printed out when the HELP button is pressed.

On Board Diagnostic (OBD) functions

The following functions are possible:

01 - Check Control Module Versions ⇒ [page 01-123](#)

02 - Check DTC Memory ⇒ [page 01-113](#) .

03 - Output Diagnostic Test Mode ⇒ [page 01-124](#) .

05 - Erase DTC Memory ⇒ [page 01-137](#) .

06 - End Output ⇒ [page 01-139](#) .

07 - Code Control Module ⇒ [page 01-131](#) .

08 - Read Measuring Value Block ⇒ [page 01-133](#) .

10 - Adaptation ⇒ [page 01-135](#) .

Check DTC Memory (scan tool function 02)

Note:

The DTC display information is updated only when initiating the On Board Diagnostic (OBD) or "Erase DTC Memory" function 05.

- Switch printer on by pressing PRINT button (indicator lamp in button lights up).

Carrying out "Check DTC Memory" function 02

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -2- to select "Check DTC Memory" function 02.

Rapid data transfer Q
02 - Check DTC Memory



Indicated on display

- Press -Q- button to confirm input.

X DTC recognized →



Display indicates the number of stored malfunctions.

The stored malfunctions are shown and then printed in series.

- Using malfunction print-out, refer to DTC table and repair malfunctions
⇒ [page 01-115](#) .

01-114

No DTC recognized



If the message "No DTC recognized" is displayed, the program can be returned to the starting point by pressing the → button.

Rapid data transfer

HELP

Select function XX



Indicated on display

If something else is displayed:

⇒ *Scan tool operating instructions*

- Erase DTC Memory (function 05) ⇒ [page 01-137](#) .
- End Output (function 06) ⇒ [page 01-139](#) .
- Switch ignition off and Disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).

Diagnostic Trouble Code (DTC) table, interior monitoring

Notes:

- ◆ *The following table lists all the DTCs that can be recognized by the control module for interior monitoring and printed out by the VAG1551 Scan Tool (ST). The DTCs are listed in order according to their 5-digit numbers.*
- ◆ *DTC 5-digit numbers appear only on the print-out from the scan tool.*
- ◆ *Before replacing a component shown as malfunctioning, check wiring and connections to the component as well as the Ground (GND) connections according to the relevant wiring diagram.*
- ◆ *When a repair has been completed, the system should be armed and then disarmed. Then check and erase DTC memory using the VAG1551 Scan Tool (ST).*
- ◆ *DTC memory records all static and sporadic malfunctions. When a malfunction occurs, it is first identified as a static malfunction. If it does not occur again it is registered as a sporadic malfunction, and the letters "/SP" appear at the right of the display.*
- ◆ *After system is armed, all existing malfunctions are automatically re-classified as sporadic malfunctions and will only be registered as static malfunctions if they still occur after testing.*
- ◆ *Sporadic malfunctions which no longer occur after 50 driving cycles are erased automatically.*
- ◆ *The three digit malfunction type number appearing next to the DTC is a data code which may be disregarded.*

01-116

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01377 Left Ultra-Sonic Sensor for ATW-G170 ♦ Short circuit to B+ ♦ Open circuit/Short circuit to Ground ♦ Incorrect Signal	♦ Short circuit between -G170- and control module -J347- ♦ -G170- faulty ♦ Open circuit in wiring between -G170- and control module -J347- ♦ -G170- faulty ♦ Malfunctions during activation of ultrasonic interior monitoring	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace -G170-. ⇒ Repair Manual, Body Interior, Repair Group 70 - Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace -G170-. ⇒ Repair Manual, Body Interior, Repair Group 70 - Perform function test ⇒ page 01-128 .

<http://127.0.0.1:8080/audi/servlet/Display?action=Goto&type=repair&id=AUDI.B5.BD04.01.4>

◆ Incorrect Signal	◆ Malfunctions during activation of ultrasonic interior monitoring	- Perform function test ⇒ page 01-128 .

01-118

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01379 Interior Monitor Switch-E183 ♦ Short circuit to Ground 1)	♦ Wiring malfunction between switch for passenger compartment monitoring -E183- and control module for ultra-sound sensors -J347- ♦ -E183- faulty	- Repair wiring according to wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace -E183-. ⇒ Repair Manual, Body Interior, Repair Group 68
01380 Alarm Via ATW Sensor rl	♦ Break in attempt at left-rear side window or after a function test ♦ False alarm	- Erase DTC memory. - Perform function test ⇒ page 01-128 . - Adapt sensitivity of sensors ⇒ page 01-135 .
01381 Alarm Via ATW Sensor rr	♦ Break in attempt at right-rear side window or after a function test ♦ False alarm	- Erase DTC memory. - Perform function test ⇒ page 01-128 . - Adapt sensitivity of sensors ⇒ page

	01-135 .
1) A malfunction is stored if the Ground is connected for more than 1 minute.	

01-119

DTC VAG 1551 scan tool display	Possible cause	Corrective action
01382 Alarm Via ATW Sensor fl	◆ Break in attempt at left-front side window or after a function test ◆ False alarm	- Erase DTC memory. - Perform function test ⇒ page 01-128 . - Adapt sensitivity of sensors ⇒ page 01-135 .
01383 Alarm Via ATW Sensor fr	◆ Break in attempt at right-front side window or after a function test ◆ False alarm	- Erase DTC memory. - Perform function test ⇒ page 01-128 . - Adapt sensitivity of sensors ⇒ page 01-135 .

01-120

V.A.G 1551 Scan Tool display	Possible cause	Corrective action
01384 1) Alarm via glass break sensor (sensor for broken window glass rear left -G183-; sensor for broken window glass rear right -G184- and conductor loop for rear window heater)	◆ Short circuit or open circuit in harness connectors or in wire connections between glass break sensors and rear window heater to control module for ultra-Sound sensors - J347- ◆ ATS was triggered by a break-in attempt via one of the side windows or the rear window. ◆ Conductor loop in one of the side windows or rear window has an open circuit ◆ False alarm	- Erase DTC memory - Repair wiring according to wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Replace side window with the interrupted conductor loop ⇒ <i>Repair Manual, Body Exterior; Repair Group. 64; Side window Avant, removing and installing</i> - Replace rear window with the interrupted conductor loop ⇒ <i>Repair Manual, Body Exterior; Repair Group. 64; Rear window Avant, removing and installing</i>

¹⁾ Only for Avant

01-121

V.A.G 1551 Scan Tool display	Possible cause	Corrective action
01403 1) Glass break sensors rear (sensor for broken window glass rear left -G183-; sensor for broken window glass rear right -G184- and conductor loop for rear window defroster)	◆ A short circuit or an open circuit occurs in the harness connectors or in the wire connections between glass break sensors and rear window heater to control module for ultra-sound sensors -J347- when setting ATS. ◆ A conductor loop of one of the side windows or the rear window is interrupted during setting of the ATS	- Erase DTC memory - Repair wiring according to wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations binder</i> - Check conductor loop in side windows and replace side window if necessary ⇒ Repair Manual, Body Exterior; Repair Group. 64; Side window Avant, removing and installing - Check conductor loop in rear window and replace rear window if necessary ⇒ Repair Manual, Body Exterior; Repair Group. 64; Rear window Avant, removing and installing
65535		

Control Module Malfunctioning	- Replace control module.

1) Only for Avant

01-122

Interior monitoring function test

- Open side window approx. 10 cm.
- Switch ignition off and remove ignition key.
- Close all doors.
- Lock vehicle, which will set the anti-theft warning system and the interior monitoring.
- Wait 30 seconds until all warning lamps in door trim blink slowly in 2 second intervals ($f = 0,5$ Hz).
- Insert hand through window opening and hold in proximity of sensor.
- If the interior monitoring is OK, alarm will be triggered. An entry into DTC memory of control module for central locking "1370; alarm via interior monitoring" as well as to ultra-sound control module "alarm via sensor for ATS, fl, fr, rl, rr".
- Switch off alarm by unlocking vehicle.
- DTC must be checked and erased in DTC

memory of the respective control module

Check Control Module Versions (scan tool function 01)

- Press buttons -0- and -1- to select "Check Control Module Versions" function 01.

Rapid data transfer Q
01 - Check Control Module Versions

➤ Indicated on display

- Press -Q- button to confirm input.

4B0951173 Interior monitoring. D00 ➡
Coding 00101 WSC 06812

➤ Indicated on display

Explanation of display

- ◆ 4B0951173: Part No. of control module
- ◆ Interior monitoring: system identification and variation
- ◆ D00: software version
- ◆ Coding 00101: coding ⇒ [page 01-131](#)
- ◆ WSC 06812: dealership number

- The program can be returned to the starting point by pressing the ➡ button.

Rapid data transfer HELP
Select function XX

➤ Indicated on display

Output Diagnostic Test Mode (scan tool function 03)

Notes:

- ◆ *The Output Diagnostic Test Mode may only be performed with the vehicle stationary and the engine not running.*
- ◆ *Any malfunctions identified by the Output Diagnostic Test Mode must be checked and repaired.*

Performing output Diagnostic Test Mode (DTM):

Rapid data transfer HELPSelect function XX



Indicated on display:

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode (DTM)" function 03.

Rapid data transfer Q03 - Output Diagnostic Test Mode



Indicated on display:

- Press -Q- button to confirm input.

The output DTM activates the following elements in sequence:

- ◆ Warning lamps next to door locking button on driver-side or passenger-side door

- ◆ An anti-theft warning system alarm
- ◆ Wiring for voltage supply to the ultra-sound sensors
- ◆ Wiring for pulse signal to the ultra-sound sensors

01-125**Note:**

No "ATS alarm" can be triggered via this output Diagnostic Test Mode (DTM). To trigger a "ATS alarm", perform the actuator test via the control module for central locking ⇒ [page 01-91](#) or a function test ⇒ [page 01-122](#) .

Carrying out "Output Diagnostic Test Mode" function 03

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode" function 03.

Rapid data transfer 
03 - Output Diagnostic Test Mode



Indicated on display

- Press -Q- button to confirm input.

Output Diagnostic Test Mode 
Alarm System Indicator Light -K95



Indicated on display

Warning lamps next to the door locking button at the driver-side or passenger-side door are activated.

- Press  button.

Output Diagnostic Test Mode 
Create active alarm



Indicated on display

The control module sends an alarm signal to the anti-theft system control module for a signal test ⇒ [page 01-128](#) .

- Press  button.

Output Diagnostic Test Mode 
Voltage supply wire

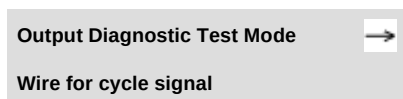


Indicated on display

The control module sends a constant voltage of 8 V to test the wiring ⇒ [page 01-129](#) .

- Press  button.

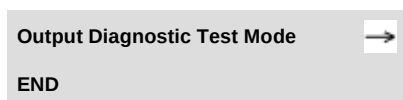
01-127



Indicated on display

The control module sends a constant voltage of 5 V to test the wiring ⇒
[page 01-130](#) .

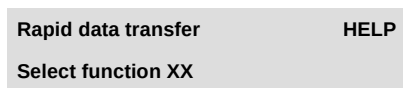
- Press → button.



Indicated on display

- Press → button.

The program is now back at its starting point.



Indicated on display

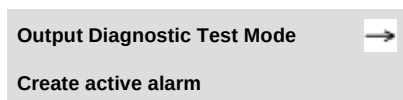
Testing alarm signal

- Switch ignition off and remove ignition key.
- Connect VAG1551 Scan Tool (ST) (⇒ [page 01-1](#)), and press buttons -4- and -5- to select "Int. Monitoring" address word 45.
- Close all doors and open one side window.
- Lock vehicle by reaching through open window. The anti-theft system horn confirms this, but warning lamps do not light up.
- Wait 30 seconds until anti-theft system is armed.
- Perform Output Diagnostic Test Mode (⇒ [page 01-124](#)) and select control element test "Create active alarm."

Notes:

- ◆ *It is also possible to test the alarm activation signal without using the VAG1551 Scan Tool (ST). To do this, carry out the first, third, fourth and fifth procedure steps listed above.*

- ◆ *The independent repair shop and the customer can thereby test the functional capability of the ultrasonic interior monitoring system.*



Indicated on display

Specification: anti-theft system (turn signals and anti-theft horn) is triggered.

- Shut off alarm by unlocking vehicle.
- End Output Diagnostic Test Mode (DTM).
- Initiate On Board Diagnostic (OBD) for anti-theft system.
- Erase DTC memory ⇒ [page 01-137](#) .

Checking power supply wiring

- Remove both ultra-sound sensors.

⇒ [Repair Manual, Body Interior, Repair Group 70, B-pillar trim , removing and installing](#)

- Disconnect electronic harness connectors.
- Perform Output Diagnostic Test Mode (⇒ [page 01-124](#)) and select output test "Power supply wiring."

Output Diagnostic Test Mode



Power supply wiring



Indicated on display

- Using multimeter (Fluke 83 or equivalent), measure voltage at wiring harness connector between terminal 2 (B+) and terminal 3 (GND).

Specification: 8 V

- End output Diagnostic Test Mode (DTM).
- Install ultra-sound sensors again
- Erase DTC memory (function 05) ⇒ [page 01-137](#) .
- End output (function 06) ⇒ [page 01-139](#) .

Checking wiring for pulse signal

- Remove both ultra-sound sensors.

⇒ [Repair Manual, Body Interior, Repair Group 70, B-pillar trim , removing and installing](#)

- Disconnect electronic harness connectors.
- Perform Output Diagnostic Test Mode (DTM) (⇒ [page 01-124](#)) and select control element test "Signal pulse wire."

Output Diagnostic Test Mode



Signal pulse wire



Indicated on display

- Using multimeter (Fluke 83 or equivalent), measure voltage at wiring harness connector between terminal 1 (pulse signal) and terminal 3 (GND).

Specification: 5 V

- End Output Diagnostic Test Mode (DTM).
- Re-install ultra-sound sensors.
- Erase DTC memory (function 05) ⇒ [page 01-137](#) .
- End Output (function 06) ⇒ [page 01-139](#) .

01-131

Code Control Module (scan tool function 07)

This function can be used to code the interior monitoring as follows:

- ◆ Vehicle type: Audi A4
- ◆ Arming mode of anti-theft system: dynamic (m.y. 1997), or static (as of m.y. 1998)
- ◆ Body version: Sedan/Avant

Notes:

- ◆ *The coding adjusts the control module for ultra-sound sensors -J347- to meet the specific requirements of the particular model version and anti-theft alarm system.*
- ◆ *The coding table gives only the coding applicable to the Audi A4.*

Carrying out "Code Control Module" function 07



Indicated on display

- Press buttons -0- and -7- to select "Code Control Module" function 07.

Rapid data transfer

HELP

Select function XX

Rapid data transfer Q
07 - Code Control Module



Indicated on display

- Press -Q- button to confirm input.

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Code Control Module
Enter code number XXXXX (0-32000)



Indicated on display

- Enter code number:

Coding: 00101

00 Place holders, disregard

1 Audi A4

0 Arming mode static

1 Sedan

2 Avant

Code Control Module Q
Enter code number 00101 (0-32000)



- Indicated on display

- Press -Q- button to confirm input.

4B0951173 Interior monitoring D02 →
Coding 00101 WSC 06812



Indicated on display

- End coding by pressing → button.

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.
This will end the function.

Rapid data transfer Q
06 - End Output



Indicated on display

- Press -Q- button to confirm input.

Read Measuring Value Block (scan tool function 08)

Carrying out "Read Measuring Value Block" function 08

Rapid data transfer **HELP**
Select function XX



Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08.

Rapid data transfer **Q**
08 - Read Measuring Value Block



Indicated on display

- Press -Q- button to confirm input.

Read Measuring Value Block
Input display group number XXX



Indicated on display

- Press buttons -0-, -0- and -1- to input display group number 1 (001).
- Press -Q- button to confirm input.

The selected measuring value block is now indicated in standard format.
Evaluation ⇒ [page 01-134](#) .

Read Measuring Value Block, overview

Display group 001

Indicated on Display	Display value	Identification
Read Measuring Value Block 1 1 2 3 4	0100 1)	1 = switch positions
	100% 1)	2 = sensitivity of the sensors
		3 = not assigned
		4 = not assigned

1) Example of display.

Display value table

1	2
Switch for Int. Monitoring: : pressed = 1, not pressed = 0	50 ... 100% 3)
Driver-side door contact switch : driver-side door open = 1, driver-side door closed = 0 : armed = 1, not armed = 0	
Anti-theft warning system: : present = 1, not present = 0	
Glass breakage system 2):	

2) Avant only.

3) Refer to "Adaptation" function 10 ⇒ [page 01-135](#) .

Adaptation (scan tool function 10)

The following changes can be implemented and saved using the adaptation function:

- ◆ Sensitivity settings of the ultra-sound sensors can be set so that the sensors react with less sensitivity.

Carrying out "Adaptation" function 10

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10.

Rapid data transfer Q
10 - Adaptation



Indicated on display

- Press -Q- button to confirm input.

Adaptation
Insert channel number XX



Indicated on display

- Press buttons -0- and -1- to insert channel number 1.

Adaptation Q
Channel display 1



Indicated on display

- Press -Q- button to confirm input.

01-136

Channel 1 Adaptation 100 

Sensitivity in %  - 1 3- 

◀ Indicated on display (sensitivity of sensors is displayed: e.g. 100%)

Note:

The factory adjusted maximum sensitivity of the ultra-sound sensors is designated as 100%. The sensor sensitivity can be reduced to 50 %.

- Press  button.

Channel 1 Adaptation 100

Input adaptation value XXXXX

◀ Indicated on display

- Enter sensitivity value (e.g. 75% = 00075).

Channel 1 Adaptation 100 

Input adaptation value 00075

◀ Indicated on display

- Press -Q- button to confirm input.

Channel 1 Adaptation 75 

Sensitivity in % (-1 3- 

◀ Indicated on display

- Press -Q- button to confirm input.

Channel 1 Adaptation 75 

Store changed value?

◀ Indicated on display

- Press -Q- button to confirm input.

Channel 1 Adaptation 75 

Changed value is stored

◀ Indicated on display

- Press  button to end adaptation procedure for sensitivity.

Rapid data transfer 

◀ Indicated on display

Insert address word XX

01-137

Erase DTC Memory (scan tool function 05)

Note:

If DTC memory cannot be erased, check DTC memory again and repair malfunctions.

Requirements

- DTC memory checked
- All malfunctions repaired

After successfully checking DTC memory:

Carrying out "Erase DTC Memory" function 05

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -5- to select "Erase DTC Memory" function 05.

Rapid data transfer Q
05 - Erase DTC Memory



Indicated on display

- Press -Q- button to confirm input.

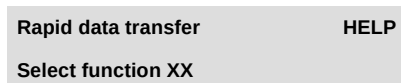
Rapid data transfer →
DTC memory is erased!



Indicated on display

DTC memory is now erased.

- Press → button.



Indicated on display

01-138

Notes:**Attention!**

DTC Memory was not interrogated

Rapid data transfer

DTC Memory was not interrogated



◆ *This message indicates an error in the test sequence.*



◆ *This message indicates an error in the test sequence.*

Adhere exactly to the test sequence: first check DTC memory and, if necessary, repair malfunctions, then erase DTC memory.

After erasing DTC memory carry out function 06 "End Output" then switch ignition off and on again and check DTC memory again.

01-139

End Output (scan tool function 06)

Carrying out "End Output" function 06

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.

Rapid data transfer Q
06 - End Output



Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer HELP
Insert address word XX



Indicated on display

- Switch ignition off.
- Disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).

01-1

Instrument cluster, On Board Diagnostic (OBD) (through M.Y. 1999)

General information

Instrument cluster technology

The Audi A4 instrument cluster is available in two versions; the low-line version with "mini-check" system and the high-line version with an LCD multi-function display.

The mini-check system monitors the brake system, Engine Coolant Temperature (ECT), fuel level and engine oil pressure.

The multi-function display contains the following functions:

- ◆ Auto check system with radio station and telephone displays
- ◆ Ambient outside temperature display
- ◆ On-board computer display
- ◆ Transmission Range (TR) selector lever display for automatic transmission

◆ Navigation

The speedometer contains a LCD display for the odometer, a trip odometer and the Service Reminder Indicator (SRI).

Indicator lamps are integrated in the speedometer and tachometer.

Accessory instruments are integrated into the instrument cluster.

The instrument cluster is controlled by a microprocessor and has extensive On Board Diagnostic (OBD) capabilities. If any component exhibit signs of failure, a Diagnostic Trouble Code (DTC) is stored in the instrument cluster DTC memory. The DTC can then be identified using the VAG1551 or VAG1552 Scan Tool (ST).

Note:

The descriptions in this Repair Manual reference the VAS5051 Diagnostic Operation Center (DOC) and the VAG1551 Scan Tool (ST).

The following Adaptations (adjustments) can be carried out using the tool:

- ◆ Adaptation of the fuel sensor characteristics
- ◆ Adaptation of the fuel consumption display
- ◆ Coding the language versions for the on-board computer and Auto Check system.
- ◆ Adaptation of the Service Reminder Indicator (SRI)
- ◆ Adaptation of the odometer after instrument cluster replacement.

Instrument cluster replacement notes

- ◆ Do not disassemble the instrument cluster.
- ◆ All warning and indicator bulbs can be replaced separately: m.y. ➤1997 ⇒ [Page 90-4](#) ; 1998 ➤ ⇒ [Page 90-15](#) . All other malfunctions require replacing the complete instrument cluster.
- ◆ If necessary, the instrument cluster should be exchanged within the parts exchange program.
- ◆ Fill in the Failure Description Form and send it in, together with the instrument cluster.
- ◆ The instrument cluster must be sent back in its original packaging.
- ◆ When replacing the instrument cluster, set the Odometer display and the Service Reminder Indicator (SRI) using the VAG1551 Scan Tool (ST) ⇒ [Page 01-32](#) .

On Board Diagnostic (OBD), initiating program

Special tools, test equipment and auxiliary items

- ◆ VAS5051 Diagnostic Operation Center (DOC) and/or VAG1551 Scan Tool (ST).
- ◆ VAG1551/3 adapter cable

Test requirements

- Fuses OK

⇒ *Electrical Wiring Diagrams Troubleshooting & Component Locations*

- Instrument cluster coding checked according to coding table ⇒ [Page 01-25](#)
- Connect VAS5051 Diagnostic Operation Center (DOC) or
- Connect VAG1551 Scan Tool (ST) ⇒ [Page 01-241](#) .

- Ignition switched on

Notes:

- ◆ *If the VAG1551 display remains blank, check the power supply.*

⇒ *Electrical Wiring Diagrams Troubleshooting & Component Locations*

- ◆ *Press the HELP button for additional operating instructions.*
- ◆ *Press the → button to advance through the program sequence.*
- ◆ *An incorrect entry can be cancelled by pressing the -C- button.*
- ◆ *In "Rapid data transfer" operating mode 1, the "Automatic Test Sequence" (address word 00) can be carried out. This will automatically check the DTC memories of all of the control modules in the vehicle which have OBD capability.*

- Switch ignition on.
- Switch printer on by pressing PRINT button (indicator light in button comes on).
- Press button -1- to select "Rapid data transfer" operating mode 1.

Rapid data transfer HELP
Insert address word XX

➤ Indicated on display

Address word for instrument cluster: 17

- Press buttons -1- and -7-.

Rapid data transfer Q
17 - Instrument Cluster

➤ Indicated on display

- Press -Q- button to confirm input.

8D0919930L B5-Instrument Cluster VDOX16
Coding 00262 WSC 06812

➤ Indicated on display (after approx. 5 seconds) (example)

- ◆ 8D0919930L: part number of instrument cluster (see also parts exchange program)
- ◆ B5-Instrument Cluster: component designation
- ◆ VDO: manufacturer ID (UN4 = Nippon Seiki, VD0 = VDO)
- ◆ X16: instrument cluster software version
- ◆ Coding 00262: instrument cluster coding
- ◆ WSC 06812: dealership number

Note:

Check coding using the coding table ⇒ [Page 01-25](#).

- Press → button.



- If one of these four messages is displayed, carry out troubleshooting procedures:

⇒ *Electrical Wiring Diagrams Troubleshooting & Component Locations*



or



or



or



Indicated on display

When the HELP button is pressed, a list of possible functions prints out.

- Press → button to advance through program sequence.

Rapid data transfer	HELP
Control module does not answer	

Rapid data transfer	HELP
Error in communication link	

Rapid data transfer	HELP
K wire not switching to Ground	

Rapid data transfer	HELP
K wire not switching to B+	

Rapid data transfer	HELP
Select function XX	

On Board Diagnostic (OBD) functions

The following functions are possible:

02 - Check DTC Memory ⇒ [Page 01-10](#)

03 - Output Diagnostic Test Mode ⇒ [Page 01-15](#)

05 - Erase DTC Memory ⇒ [Page 01-20](#)

06 - End Output ⇒ [Page 01-22](#)

07 - Code Control Module ⇒ [Page 01-23](#)

08 - Read Measuring Value Block ⇒ [Page 01-27](#)

10 - Adaptation ⇒ [Page 01-32](#)

Check DTC Memory (scan tool function 02)

Note:

The displayed DTC information is updated only when initiating OBD or with "Erase DTC Memory" function 05.

- Switch printer on by pressing PRINT button (indicator light in button comes on).

Rapid data transfer HELP
Select function XX

◀ Indicated on display

- Press buttons -0- and -2- to select "Check DTC Memory" function 02.

Rapid data transfer Q
02 - Check DTC Memory

◀ Indicated on display

- Press -Q- button to confirm input.

X DTC recognized →

◀ The number of stored DTCs appears in the display.

The stored DTCs are displayed and printed out one after the other.

- Check print-out against DTC table (⇒ [Page 01-12](#)) and repair all malfunctions as necessary.

01-11

No DTC recognized!



If "No DTC recognized!" is displayed, the program will return to "Select function XX" prompt after the → button is pressed.

Rapid data transfer

HELP

Select function XX



Indicated on display

If something different appears on the display:

⇒ *VAG1551 Scan Tool (ST) operating instructions*

- End output (function 06) ⇒ [Page 01-22](#)
- Switch ignition off and disconnect scan tool from Data Link Connector (DLC).

Diagnostic Trouble Code (DTC) table for instrument cluster

Notes:

- ◆ *The following table lists all possible Diagnostic Trouble Codes (DTCs) which the instrument cluster can recognize and which the VAG1551 scan tool can print.*
- ◆ *DTC numbers only appear on the printout.*
- ◆ *Before replacing any component shown as malfunctioning, check all related wiring and connections of these components and the Ground (GND) connections ⇒ Electrical Wiring Diagrams Troubleshooting & Component Locations*
- ◆ *After the repair has been carried out and the functional system check, re-check and erase the DTC memory using the VAG1551 scan tool.*
- ◆ *The DTC memory records all static and sporadic (intermittent) malfunctions. A malfunction is considered static if it exists for at least 2 seconds (exceptions: 60 seconds for outside temperature display and 30 minutes, for engine coolant sensor). If the malfunction is not present after this time, it will be stored as a sporadic DTC and "/SP" will appear on the right side of the scan tool display.*
- ◆ *After switching the ignition on, all existing DTCs are set to sporadic. If they are still present after the system check, they will be stored as static DTCs.*
- ◆ *If a sporadic malfunction does not reoccur within 50 driving cycles (ignition on for at least 5 minutes and vehicle speed greater than 30 km/h or 18 mph), it will be erased.*

01-13

DTC	Possible cause	Corrective action
VAG1551 scan tool display		
00667		
Ambient-Temperature Signal ♦ Open/Short circuit to B+ ♦ Short circuit to Ground	Vehicles without air conditioning: ♦ Open circuit or short circuit ♦ Outside air temperature sensor -G17- faulty	Vehicles without air conditioning: - Trace malfunction ⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations - Replace -G17-.
	Vehicles with air conditioning: ♦ Open circuit or short circuit ♦ A/C control head -E87- faulty	Vehicles with air conditioning: - Trace malfunction ⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations - Carry out OBD of air conditioning system ⇒ Repair Manual, Heating & Air Conditioning, Repair Group 01
00771		
Fuel Level Sensor-G ♦ Open/Short circuit to B+ ♦ Short circuit to Ground	♦ Open circuit or short circuit between sender for fuel gauge -G- and instrument cluster ♦ Sender for fuel gauge -G- faulty	- Trace malfunction ⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations - Replace -G-.

00779		
Outside Air Temperature Sensor-G17 ♦ Open/Short circuit to B+ ♦ Short circuit to Ground	♦ Open circuit or short circuit ♦ Outside air temperature sensor --G17-faulty	- Trace malfunction ⇒Wiring Diagrams, Troubleshooting & Component Locations - Replace -G17-.

01-14

01039		
ECT Sensor-G2 ♦ Open/Short circuit to B+ ♦ Short circuit to Ground (GND)	♦ Open circuit or short circuit between Engine Coolant Temperature Sensor (ECT) -G2- and instrument cluster ♦ ECT sensor -G2- faulty	- Trace malfunction ⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations - Replace -G2-.
01402		
Data Wire from Navigation ♦ Incorrect signal	♦ Open circuit in clock enable or data wire ♦ Navigation/instrument cluster interface malfunctioning ♦ Malfunction caused by electromagnetic interference inside and outside vehicle	- Check data wire for damage. - Check causes for electromagnetic malfunctions. ⇒ Repair Manual Radio, Telephone, Navigation, Repair Group 97
65535		
Control Module Malfunctioning	♦ Instrument cluster faulty	- Replace instrument cluster ⇒ Page 90-1 .

Output Diagnostic Test Mode (scan tool function 03)

Notes:

- ◆ *Output Diagnostic Test Mode may only be carried out on a stationary vehicle with the engine off.*
- ◆ *Trace any faults identified by the Output Diagnostic Test Mode, replace the instrument cluster if necessary.*

The function "Output Diagnostic Test Mode" cycles all the control elements in the instrument cluster sequentially, if they are installed and coded.

- ◆ Concurrent testing of the display ranges of all the analog indicators (coolant temperature gauge, tachometer, speedometer and fuel gauge).
- ◆ Activation of the mini-check indicator lights.
- ◆ Activation of the seat belt warning lamp.
- ◆ Activation of the chime.

- ◆ Segment check of the multi-function display and/or the LCD odometer.
- ◆ Activation of the instrument cluster lights and dimmer.
- ◆ Coolant excess temperature test

Notes:

- ◆ *The instrument cluster lighting test can only be carried out with the lights on.*
- ◆ *The coolant excess temperature test activates the A/C compressor safety shut-off.*

Initiating Output Diagnostic Test Mode**Note:**

The units displayed are country specific.

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode" function 03.

Rapid data transfer Q
03 - Output Diagnostic Test Mode



Indicated on display

- Press -Q- button to confirm input.

This will start the Output Diagnostic Test Mode for the analog instruments (displays).

Output Diagnostic Test Mode →
Analog Indicators



Indicated on display

01-17

After pressing the -Q- button, the following tests are run:

- ◆ Coolant temperature gauge needle moves over complete range
- ◆ Tachometer needle moves over complete range
- ◆ Speedometer needle moves over complete range
- ◆ Fuel gauge needle moves over complete range

The following preset values are displayed at the end of the test:

Coolant temperature display:	90 ° C (194 ° F)
Tachometer:	3000 RPM
Speedometer:	100 km/h (62 mph)
Fuel level:	1/2

Note:

If the ignition is switched on or off with any gauge

needle in motion, its movement will be interrupted.

01-18

Output Diagnostic Test Mode →
Instrument Cluster Warning Lights Test

- Press → button.



Indicated on display

Activation of mini-check indicator lights

- Press → button.



Indicated on display

Activation of seat belt warning light.

Output Diagnostic Test Mode →
Seat Belt Warning Light-K19

Note:

Depending on the model/equipment, the seat belt warning light will be activated via the control module coding. This means that the warning light will be inactive if this test is skipped.

- Press → button.



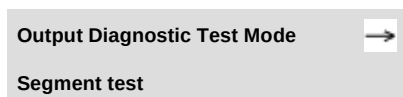
Indicated on display

The chime is activated and sounds continuously.

- Press → button.

Output Diagnostic Test Mode →
Chime

01-19

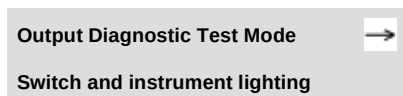


◀ Indicated on display

Notes:

- ◆ *All indicators on the multi-function display and/or the LCD odometer are cycled.*
- ◆ *All segments on the multi-function monitor light up and one bar remains dark.*

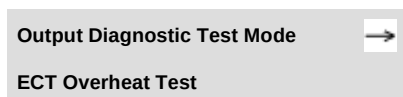
- Press → button.



◀ Indicated on display

The instrument cluster dimming is tested.

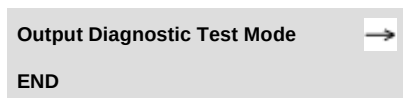
- Press → button.



◀ Indicated on display

The A/C compressor safety cut-out will be activated within approx. 5 seconds.

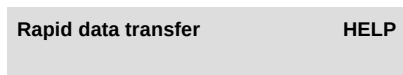
- Press → button.



◀ Indicated on display

- Press → button to end Output Diagnostic Test Mode.

This returns the scan tool to the "Select function XX" prompt.



◀ Indicated on display

Select function XX

Erase DTC Memory (scan tool function 05)

Note:

If the DTC memory cannot be erased, check DTC memory again and repair malfunctions.

Requirements

- DTC memory checked ⇒ [Page 01-10](#)
- All malfunctions repaired

After DTC memory has been successfully checked:



Indicated on display

- Press buttons -0- and -5- to select "Erase DTC Memory" function 05.

Rapid data transfer

HELP

Select function XX

01-21

Rapid data transfer Q
05 Erase DTC Memory



Indicated on display

- Press -Q- button to confirm input

Rapid data transfer →
DTC Memory is erased



Indicated on display

DTC memory is now erased.

- Press → button.

Rapid data transfer HELP
Select function XX



Indicated on display

Notes:

Attention!
DTC Memory not interrogated



- ◆ *This message indicates an error in the test sequence:*

Rapid data transfer →
DTC Memory not interrogated



- ◆ *This message indicates an error in the test sequence:*
- ◆ *Observe the test sequence exactly: first check DTC memory, if necessary repair malfunctions then erase.*

01-22

End Output (scan tool function 06)

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.

Rapid data transfer Q
06 - End Output



Indicated on display

- Press -Q- button to confirm input

Rapid data transfer HELP
Insert address word XX



Indicated on display

- Switch ignition off.
- Disconnect VAG1551 scan tool.

Code Control Module (scan tool function 07)

This function is used to code the instrument cluster with the following information:

- ◆ Optional equipment
- ◆ Country specific variations (market versions)
- ◆ Number of cylinders
- ◆ Engine versions

Notes:

- ◆ *Coding sets the various combinations of the on board computer and check package according to the optional equipment, country specific variations, number of cylinders and engine version.*
- ◆ *The coding table only contains coding combinations for the Audi A4.*

Initiating instrument cluster coding



Indicated on display

Rapid data transfer

HELP

Select function XX

- Press buttons -0- and -7- to select "Code Control Module" function 07.
- Press -Q- button to confirm input.

01-24

Code control module Q
Input code number XXXXX (0-32000)



Indicated on display

- Input code number using Coding table ⇒ [Page 01-25](#) . Example:
00262

00 no optional equipment
2 Country: USA
6 6-cylinders
2 Gasoline engine

Code Control Module Q
Input code number 00262 (0-32000)



- Indicated on display (example).
- Press -Q- button to confirm input

8D0919930L B5-INSTRCLUST VDO X16
Coding 00262 WSC 06812



Indicated on display

- Press → button to end coding process.

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -6-.

Rapid data transfer Q
06 - End Output



Indicated on display

- Press -Q- button to confirm input

01-25

Coding table

X			Optional equipment
00			No optional equipment
01			Brake pad wear indicator active
02			Seat belt warning system active
04			Washer fluid level indicator active
16			Navigation (not applicable for USA)
	X		Market version:
	0		Germany (D)
	1		Europe (EU)
	2		USA (US)
	3		Canada (CDN)
	4		Great Britain (GB)
	5		Japan (JP)
	6		Saudi Arabia (SA)
	7		Australia (AUS)

		X	Number of cylinders
		4	4-cylinders
		6	6-cylinders
		X	Engine versions
		0	TDI engine
		2	Gasoline engines, 4 and 6 cylinder

01-26

Notes:

- ◆ *Depending on the vehicle equipment, coding for optional equipment is also possible for various combinations.*
- ◆ *If more than one option that can be coded is installed, the coding must be entered as the sum of the individual coding numbers.*

Examples

- ◆ Washer fluid level indicator and brake pad wear indicator:

$$04 + 01 = 05$$

- ◆ Seat belt warning system and washer fluid level indicator:

$$02 + 04 = 06$$

01-27

Read Measuring Value Block (scan tool function 08)

Initiating "Read Measuring Value Block" function 08

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08.

Rapid data transfer Q
08 - Read Measuring Value Block



Indicated on display

- Press -Q- button to confirm input

Read Measuring Value Block HELP
Input display group number XXX



Indicated on display

- Input display group number from table (⇒ [Page 01-28](#)) and press -Q- button to confirm input.

The scan tool will indicate the selected display group.

01-28

Display group overview

Display group	Indicated on display
001	1 = Vehicle speed (kmh/MPH) 2 = Engine speed (RPM) 3 = Oil pressure switch 2 < min
002	1 = Odometer (km/mi) 2 = Fuel gauge (liters/gal) 3 = Outside temperature (° C/F)
003	1 = Engine coolant temperature (° C/F)
050	1 = Odometer (km/mi) 2 = Engine speed (RPM) 4 = Engine coolant temperature (° C/F)

Notes:

- ◆ *The display will always show the actual values from the sensors. Since the instrument panel displays filters the values, they may differ from the actual values.*

- ◆ *If the actual Engine Coolant Temperature (ECT) is between 80 °C (176 °F) and 100 °C (212 °F), the instrument panel will always display 90 °C (194 °F).*
- ◆ *Additional display groups for the instrument cluster are not possible.*

01-29

Display group 001

Read Measuring Value Block 1

→ ◀ Indicated on display

50 km/h 2400 RPM Oil press 2<min

Time

- Not activated for Audi A4

Oil pressure switch 2

- Oil pressure switch 2 < min
- Oil pressure switch 2 OK.

Engine RPM

- 0 - 9990 RPM

Road speed

- 0 - 300 km/h

01-30

Display group 002

Read Measuring Value Block 2 → ◀ Indicated on display

820 km

41 ltr.

19.0 °C

Outside Temperature

• -40 to +70 °C

Fuel level

• 0 - 100 ltr.

Odometer

Display group 003

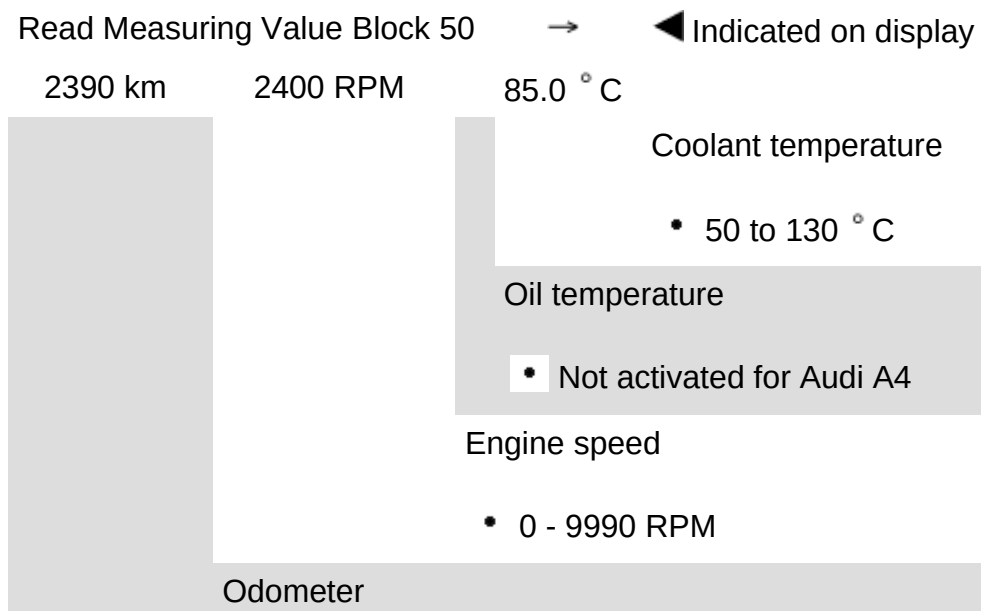
Read Measuring Value Block 3 → ◀ Indicated on display

85.0 °C

Coolant temperature

• 50 to 130 °C

01-31

Display group 050

Adaptation (scan tool function 10)

Function 10 is used to initiate and store the following changes:

- ◆ Adaptation of fuel gauge display
- ◆ Correction of the fuel consumption display
- ◆ Coding of language versions for Auto Check system
- ◆ Adaptation of the Service Reminder Indicator (SRI)
- ◆ Setting the odometer after instrument cluster replacement.

Individual functions are called up by entering the appropriate adaptation channel number (see adaptation table ⇒ [Page 01-33](#)).

Adaptation table

Adaptation channel	Adaptation function
01	Adaptation of fuel gauge display ⇒ Page 01-35
02	Resetting SRI after service ⇒ Page 01-45
03	Adaptation of fuel consumption display ⇒ Page 01-39
04	Language versions of the multi-function display ⇒ Page 01-42
05	SRI - service interval for oil change (distance in km) ⇒ Page 01-48
06	SRI - service interval 1 (IN1) distance in km ⇒ Page 01-51
07	SRI - service interval 1 (IN1) time in days ⇒ Page 01-54
08	SRI - service interval 2 (IN2) time in days ⇒ Page 01-57
09	Adapting odometer reading ⇒ Page 01-60

M.y. 1998 ➤

Adaptation channel	Adaptation function
10	SRI Remaining distance until next oil change service interval after replacing instrument cluster ⇒ Page 01-64
11	SRI Remaining distance until next service interval after replacing instrument cluster ⇒ Page 01-67
12	SRI Remaining time until next service interval after replacing instrument cluster ⇒ Page 01-70
30	Adaptation of fuel gauge sender ⇒ Page 01-73

Initiating "Adaptation" function 10

Rapid data transfer	HELP
Select function XX	



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10.

Read Measuring Value Block	Q
10 - Adaptation	



Indicated on display

- Press -Q- button to confirm input.

Adaptation	Q
Insert channel number XX	



Indicated on display

- Insert desired adaptation channel (⇒ Adaptation table, ⇒ [Page 01-33](#)).
- Press -Q- button to confirm input.

Note:

After changing an adaptation value or after an adaptation in a specific channel has been completed, "Adaptation" function 10 must be selected again in order to select another adaptation channel.

01-35

Adaptation of fuel gauge display

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10 and press - Q- button to confirm input.

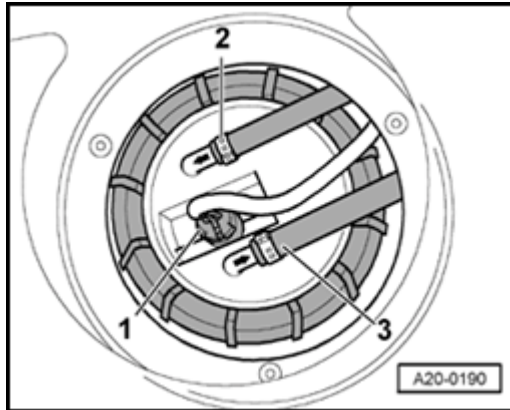
Adaptation Q
Insert channel number XX



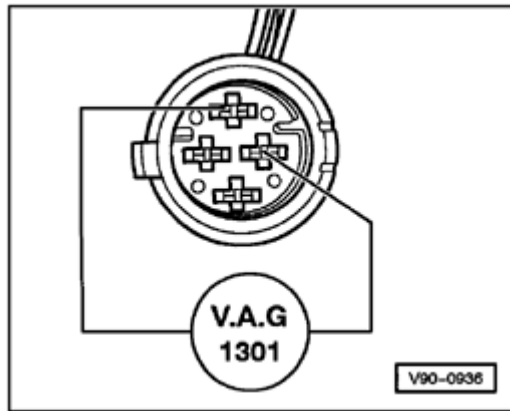
Indicated on display

- Press buttons -0- and -3- to insert channel 03.
- Press -Q- button to confirm input

01-36

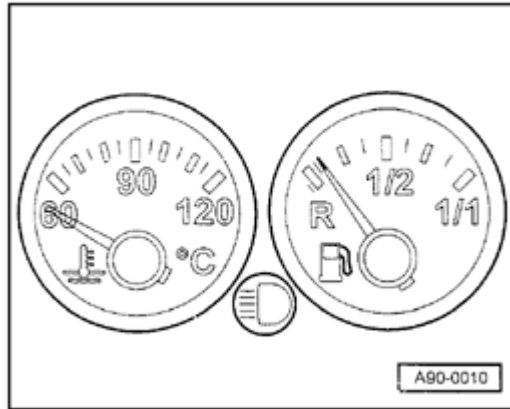


- Disconnect fuel level sensor harness connector (near rear seat back, under trim in trunk), then perform adaptation of fuel level display.
- Switch ignition off.



- Using test lead, connect VAG1301 resistance tester to fuel level sensor (see illustration).
- Set VAG1301 to value of 470.
- Wait approx. 4 minutes, switch ignition on and observe fuel gauge.

01-37



Channel 1 Adaptation 128



< - 13 - >

Note:

The fuel gauge reading is correct if the needle remains on the red section at the right side of the reserve zone (see illustration).

- Press buttons -0- and -1-.
- Press -Q- button to confirm input



- Indicated on display

The new adaptation value can be entered in two ways: step-by-step or directly.

Note:

If a value over 255 is entered, the "adaptation" function will be cancelled and the procedure will have to be started again.

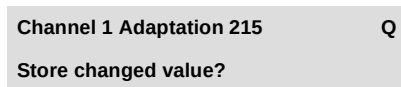
01-38

Step-by-step method:

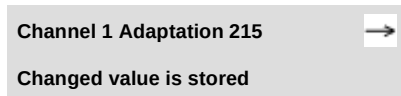
- Press button -1- to adjust value downward, down to 0 or press button -3- to adjust value upward, up to 255 (example: 215).



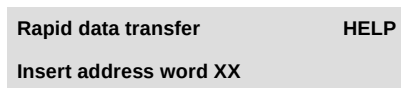
- Indicated on display
- Press -Q- button to confirm input.



- Indicated on display
- Press -Q- button to confirm input



- Indicated on display
- Press → button to end fuel gauge adjustment.



Indicated on display

01-39

Adapting fuel consumption display (direct input method)

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10 and press -Q- button to confirm input.

Adaptation Q
Insert channel number XX



Indicated on display

- Press buttons -0- and -3- to insert channel 03.
- Press -Q- button to confirm input

Notes:

- ◆ The value entered must be between 85% and 115%.
- ◆ Input is in steps of 5%.

Channel 3 Adaptation 100 →
< -1 3- >



Indicated on display

- Press → button.

01-40

Note:

Correction of the fuel consumption display is only carried out with the direct input method.

Channel 3 Adaptation 100
Input adaptation value XXXXX



Indicated on display

- Input desired correction value using keypad on VAG1551, fill in leading digits with zeroes "0".

Example:

Desired input value: 90%

Keyboard entry: 00090

Channel 3 Adaptation 100 Q
Input adaptation value 00090



Indicated on display

- Press -Q- button to confirm input

Channel 3 Adaptation 90 Q
Store changed value?



Indicated on display

- Press -Q- button to confirm input

Channel 3 Adaptation 90 →
Changed value is stored



Indicated on display

- Press → button to end adaptation.

01-41

Rapid data transfer HELP
Insert address word XX



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10 and press -Q- button to confirm input.

Note:

If an incorrect entry is made, the VAG1551 will switch to the following display:

Function is unknown →
or cannot be carried out at the moment.



Indicated on display

- Press → button.
- Select "Adaptation" function 10 and adaptation channel 03 again.
- Repeat adaptation of fuel consumption display and press -Q- button to confirm input.

01-42

Adapting multi-function display language versions

Note:

Adaptation is only carried out on vehicles equipped with on board computer.

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10 and press -Q- button to confirm input.

Adaptation Q
Insert channel number XX



Indicated on display

- Press buttons -0- and -4-.
- Press -Q- button to confirm input

Channel 4 Adaptation 1 →
< -1 3- >



Indicated on display

Notes:

- ◆ *The display shows only the last digit of the five-digit language code, e.g. 1 for German.*
- ◆ *Input of incorrect values will end the adaptation function. "Adaptation" function 10 must be selected again.*
- ◆ *When using the VAG1551 keypad, only the direct input method can be used.*

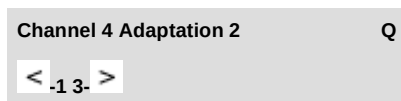
01-43

Language version coding table

Code	Language
00001	German
00002	English
00003	French
00004	Italian
00005	Spanish
00006	Portuguese

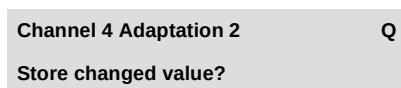
Step-by-step method:

- Press button -1- to move downward and button -3- to move upward through codes. Example: 2 for English.



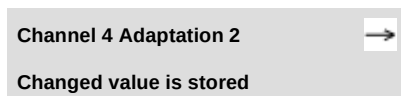
◀ Indicated on display

- Press -Q- button to confirm input.



◀ Indicated on display

- Press -Q- button to confirm input.



◀ Indicated on display

- Press → button to end language version adaptation.

01-44

Direct input method:

Channel 4 Adaptation 1 

< -1 3- >

➤ Indicated on display

- Press  button.

Channel 4 Adaptation 1 Q

Input adaptation value XXXXX

➤ Indicated on display

- Input desired 5-digit code using keypad ⇒ [Page 01-43](#) .

Example:

Code: 2 (English)

Input value: 00002

- Press -Q- button to confirm input.

Channel 4 Adaptation 1 Q

Input adaptation value 00002

➤ Indicated on display

- Press -Q- button to confirm input.

Channel 4 Adaptation 2 Q

< -1 3- >

➤ Indicated on display

- Press -Q- button to confirm input.

Channel 4 Adaptation 2 Q

Store changed value?

➤ Indicated on display

- Press -Q- button to confirm input.

Indicated on display

Channel 4 Adaptation 2



Changed value is stored



- Press → button to end language version adaptation.

01-45

Resetting SRI after servicing

Rapid data transfer	HELP
Select function XX	



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10 and press -Q- button to confirm input.

Adaptation	Q
Insert channel number XX	



Indicated on display

- Press buttons -0- and -2- to insert channel 02.
- Press -Q- button to confirm input.

Notes:

- ◆ *It is possible to reset the SRI without using the VAG1551/1552 ⇒ [Page 01-77](#) .*
- ◆ *Adaptation channel 2 can only be used for instrument clusters with data version D05 and newer.*

01-46



◀ Indicated on display. (service interval will be displayed, e.g. 1)

1 - indicates that the oil service is due.

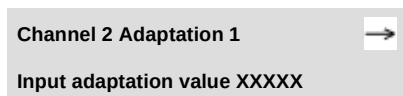
10 - indicates that the inspection service is due.

11 - indicates that oil and inspection services are due.

Note:

Reset the SRI using only the direct input method.

- Press → button.



◀ Indicated on display

Delete the following service events by using the adaptation values listed below:

Adaptation value	Service Event
00000	Delete OIL and INSP
00010	Delete OIL
00001	Delete INSP

- Using keypad, enter appropriate adaptation value to delete service event, e.g. 00000.

- Press -0- button five times.

01-47

Channel 2 Adaptation 1 Q
Input adaptation value 00000



Indicated on display

- Press -Q- button to confirm input.

Channel 2 Adaptation 0 Q
< . 1 3 . >



Indicated on display

- Press -Q- button to confirm input.

Channel 2 Adaptation 0 Q
Store changed value?



Indicated on display

- Press -Q- button to confirm input.

Channel 2 Adaptation 0 →
Changed value is stored



Indicated on display

- Press → button to end SRI reset.

Adapting SRI for oil change service interval (distance in km)

This function is used to enter the distance (in km) until the next oil change service is due (see service schedule "Maintenance Service").

Rapid data transfer HELP
Select function XX



Indicated on display

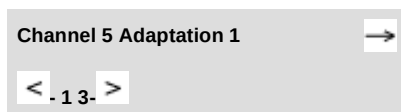
- Press buttons -1- and -0- to select "Adaptation" function 10 and press - Q- button to confirm input.

Adaptation Q
Insert channel number XX



Indicated on display

- Press buttons -0- and -5- to insert channel 05.
- Press -Q- button to confirm input.



◀ Indicated on display

The display shows the number of kilometers remaining until the next oil change service is due (the "1" indicates 1000 km remaining).

Notes:

- ◆ *Values can only be entered in increments of 1000 km. Therefore, the distance indicated is in units of 1000.*
 - ◆ *In countries where speedometers are calibrated in miles, adjustments must still be made in kilometers. Therefore convert miles to kilometers ($\text{miles} \times 1.609 = \text{kilometers}$) to get the required adaptation value.*
 - ◆ *If the instrument cluster must be replaced, observe notes ⇒ [Page 01-75](#).*
 - ◆ *When using the scan tool keypad, only the direct input method can be used.*
 - ◆ *If an incorrect value is input, the "adaptation" function 10 will be cancelled and must be initiated again.*
- Press → button.

01-50

Channel 5 Adaptation 1

Input adaptation value XXXXX



Indicated on display

- Input desired interval value using keypad on VAG1551, fill in leading digits with zeroes "0."

Example:

Specification: 15000 km

Input value: 00015

Channel 5 Adaptation 1

Q

Input adaptation value 00015



Indicated on display

- Press -Q- button to confirm input.

Channel 5 Adaptation 15

Q

< 1 3 >



Indicated on display

- Press -Q- button to confirm input.

Channel 5 Adaptation 15

Q

Store changed value?



Indicated on display

- Press -Q- button to confirm input.

Channel 5 Adaptation 15



Changed value is stored



Indicated on display

- Press → button to end SRI adaptation.

01-51

Adapting SRI for inspection service Interval-1 (IN1) (distance in km)

This function is used to enter the distance remaining (distance in km) until the next maintenance service is due (see service schedule "Maintenance Service").

Rapid data transfer **HELP**
Select function XX



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10 and press -Q- button to confirm input.

Adaptation **Q**
Insert channel number XX



Indicated on display

- Press buttons -0- and -6- to insert channel 06.
- Press -Q- button to confirm input.

Channel 6 Adaptation 5

< -13- >



Indicated on display

The display shows the number of kilometers remaining until the next maintenance service is due (the "5" indicates 5000 km remaining).

Notes:

- ◆ *Values can only be entered in increments of 1000 km. Therefore, the distance indicated is in units of 1000.*
 - ◆ *In countries where speedometers are calibrated in miles, adjustments must still be made in kilometers. Therefore convert miles to kilometers ($\text{miles} \times 1.609 = \text{kilometers}$) to get the required adaptation value.*
 - ◆ *If the instrument cluster must be replaced, observe notes [⇒ Page 01-75](#).*
 - ◆ *When using the scan tool keypad, only the direct input method can be used.*
 - ◆ *If an incorrect value is input, the "adaptation" function 10 will be cancelled and must be initiated again.*
- Press → button.

01-53

Channel 6 Adaptation 11
Input adaptation value XXXXX



Indicated on display

- Input desired interval value using keypad on VAG1551, fill in leading digits with zeroes "0."

Example:

Specification: 30000 km

Input value: 00030

Channel 6 Adaptation 11 Q
Input adaptation value 00030



Indicated on display

- Press -Q- button to confirm input.

Channel 6 Adaptation 30 Q
< -1 3- >



Indicated on display

- Press -Q- button to confirm input.

Channel 6 Adaptation 30 Q
Store changed value?



Indicated on display

- Press -Q- button to confirm input.

Channel 6 Adaptation 30 →
Changed value is stored



Indicated on display

- Press → button to end SRI adaptation.

Rapid data transfer HELP
Select function XX



Indicated on display

01-54

Adapting SRI for inspection service Interval-1 (IN1) (time in days)

This function is used to enter the time until the next inspection service 1 is due (see service schedule "Maintenance Service").

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10 and press -Q- button to confirm input.

Adaptation Q
Insert channel number XX



Indicated on display

- Press buttons -0- and -7- to insert channel 07.
- Press -Q- button to confirm input.



◀ Indicated on display

The display shows the days remaining until the next inspection service 1 is due (in this example "11" indicates 110 days remaining).

Notes:

- ◆ *Values can only be entered in increments of 10 days. Therefore the display shows blocks of 10 days.*
 - ◆ *If the instrument cluster must be replaced, observe notes ⇒ [Page 01-75](#).*
 - ◆ *When using the scan tool keypad, only the direct input method can be used.*
 - ◆ *If an incorrect value is input, the "adaptation" function 10 will be cancelled and must be initiated again.*
- Press → button.

01-56

Channel 7 Adaptation 11

Input adaptation value XXXXX



Indicated on display

- Input desired interval value using keypad on VAG1551, fill in leading digits with zeroes "0."

Example:

Specification: 360 days

Input value: 00036

Channel 7 Adaptation 11

Q

Input adaptation value 00036



Indicated on display

- Press -Q- button to confirm input.

Channel 7 Adaptation 36

Q

< . 1 3 . >



Indicated on display

- Press -Q- button to confirm input.

Channel 7 Adaptation 36

Q

Store changed value?



Indicated on display

- Press -Q- button to confirm input.

Channel 7 Adaptation 36



Changed value is stored



Indicated on display

- Press → button to end SRI adaptation.

Rapid data transfer

HELP

Select function XX



Indicated on display

01-57

Adapting SRI for inspection service Interval-2 (IN2) (time in days)

This function is used to enter the time until the next inspection service 2 is due (see service schedule "Maintenance Service").

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10 and press - Q- button to confirm input.

Adaptation Q
Insert channel number XX



Indicated on display

- Press buttons -0- and -8-.
- Press -Q- button to confirm input.



◀ Indicated on display

The display shows the days remaining until the next inspection service 2 is due (in this example "45" indicates 450 days remaining).

Notes:

- ◆ *Values can only be entered in increments of 10 days. Therefore the display shows blocks of 10 days.*
 - ◆ *If the instrument cluster must be replaced, observe notes ⇒ [Page 01-75](#).*
 - ◆ *When using the scan tool keypad, only the direct input method can be used.*
 - ◆ *If an incorrect value is input, the "adaptation" function 10 will be cancelled and must be initiated again.*
- Press → button.

01-59

Channel 8 Adaptation 45

Input adaptation value XXXXX



Indicated on display

- Input desired interval value using keypad on VAG1551, fill in leading digits with zeroes "0."

Example:

Specification: 720 days

Input value: 00072

Channel 8 Adaptation 45

Q

Input adaptation value 00072



- Indicated on display
- Press -Q- button to confirm input.

Channel 7 Adaptation 72

Q

< -1 3 - >



- Indicated on display
- Press -Q- button to confirm input.

Channel 7 Adaptation 72

Q

Store changed value?



- Indicated on display
- Press -Q- button to confirm input.

Channel 7 Adaptation 72



Changed value is stored



- Indicated on display
- Press → button to end SRI adaptation.

Rapid data transfer

HELP

Select function XX



Indicated on display

Adapting odometer display (km/mi)

This function is used to adapt the odometer reading (in km or miles) after replacing the instrument cluster.

Notes:

- ◆ *The adaptation function can only be carried out on an instrument cluster with an odometer reading of not more than 100 kilometers (62 miles).*
- ◆ *The adaptation function can only be carried out once for each instrument cluster.*
- ◆ *Only a larger adaptation value can be entered, not a lower one.*
- ◆ *If an incorrect value is entered and confirmed, no correction is possible. If this is the case, the instrument cluster must be replaced with a new one.*
- ◆ *In countries where speedometers are calibrated in miles, adjustments must still be made in kilometers. Therefore convert miles to kilometers (miles x 1.609 = kilometers) to get the required adaptation value.*

- ◆ *If the instrument cluster must be replaced, observe notes ⇒ [Page 01-75](#) .*

01-61

Selecting function:

- Press -C- button.



Indicated on display

- Press buttons -1- and -1- to select "Login-Procedure" function 11.



Indicated on display

- Press -Q- button to confirm input.



Indicated on display

- Enter code number 13861.



Indicated on display

- Press -Q- button to confirm input.



Indicated on display

- Press buttons -1- and -0- to select "Adaptation" function 10.



Indicated on display

- Press -Q- button to confirm input.



Indicated on display

Rapid data transfer HELP
Select function XX

Rapid data transfer Q
11 - Login-procedure

Login procedure
Enter code number XXXXX

Login procedure Q
Enter code number 13861

Rapid data transfer HELP
Select function XX

Rapid data transfer Q
10 - Adaptation

Adaptation Q
Insert channel number XX

01-62

- Press buttons -0- and -9- to select channel number 09.

- Press -Q- button to confirm input

➤ Indicated on display

Note:

When using the VAG1551 keypad, only the direct input method can be used.

- Press → button to advance through program sequence.

➤ Indicated on display

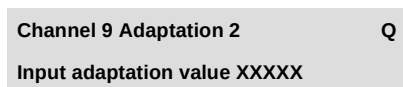
- Input adaptation value using keypad.

Example:

Odometer reading = 89627

0 8 9 6 3

X					Hundred thousands: 100000 - 655350 km



01-1

Radio, On Board Diagnostic (OBD) (m.y. 1998 ➤)

General information

Technical features of radio systems

The new generation of the Audi radio system has extensive On Board Diagnostic (OBD) capability.

All radio units have a Diagnostic Trouble Code (DTC) memory. If a malfunction occurs in one of the components or wires which is monitored by the system, a record of the type of malfunction is stored in DTC memory.

Radio On Board Diagnostic (OBD), initiating program

Test requirements

- Fuse OK per wiring diagram

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

- VAG1551 Scan Tool (ST) connected ⇒ [page 01-108](#)
- Ignition switched on

Notes:

- ◆ *If the display remains blank, check the voltage supply of the VAG1551 Scan Tool (ST) according to the wiring diagram.*
- ◆ *Additional operating instructions can be printed out by pressing the HELP button.*
- ◆ *The → button is used to advance through the program sequence.*

- ◆ *If an incorrect entry is made, press the -C- button to escape.*
- ◆ *In "Rapid data transfer" operating mode 1 the "Automatic Test Sequence" function 00 can be carried out. This checks DTC memory of all vehicle control modules (with OBD capability) automatically.*

- Switch ignition on.
- Switch printer on by pressing PRINT button (indicator lamp in button lights up).
- Press button -1- to select "Rapid data transfer" operating mode 1.

Rapid data transfer HELP
Insert address word XX



Indicated on display

Address word for radio: 56

- Press buttons -5- and -6- to insert "Radio" address word 56.

Rapid data transfer Q
56 - Radio



Indicated on display

- Press -Q- button to confirm input.

Note:

While the On Board Diagnostic (OBD) program is running "DIAG" will appear on the radio unit display.

01-4

4B0035186A	Radio	D01	→
Coding 00017		WSC 06812	



Indicated on display (after about 5 seconds):

- ◆ 4B0035186A: Part No. for radio (⇒ parts catalog)
- ◆ Radio: component designation
- ◆ D01: software version installed in radio
- ◆ Coding 00017: radio coding
- ◆ WSC 06812: dealership number

Note:

Check coding against coding table ⇒ [page 01-22](#) .

- Press → button.

01-5

Rapid data transfer **HELP**
Control module does not answer



- If display shows one of the following messages, carry out troubleshooting procedure as described in troubleshooting program for diagnostic wiring.

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

Rapid data transfer **HELP**
Error in communication link

Rapid data transfer **HELP**
K wire not switching to Ground

Rapid data transfer **HELP**
K wire not switching to B+

Rapid data transfer

HELP

Select function XX



Indicated on display

After the HELP button is pressed, a list of the possible functions is printed out.

- Press → button to advance through program sequence.

On Board Diagnostic (OBD) functions

The following functions are possible:

02 - Check DTC Memory ⇒ [page 01-7](#)

03 - Output Diagnostic Test Mode (DTM) ⇒ [page 01-14](#)

05 - Erase DTC Memory ⇒ [page 01-16](#)

06 - End Output ⇒ [page 01-18](#)

07 - Code Control Module ⇒ [page 01-19](#)

08 - Read Measuring Value Block ⇒ [page 01-25](#)

Check DTC Memory (scan tool function 02)

Note:

The displayed malfunction is only updated when the On Board Diagnostic (OBD) program is initiated or when "Erase DTC Memory" function 05 is used.

- Switch on printer by pressing PRINT button (indicator lamp in button lights up).

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -2- to select "Check DTC Memory" function 02.

Rapid data transfer Q
02 - Check DTC Memory



Indicated on display

- Press -Q- button to confirm input.

X DTC recognized!



Indicated on display (the number of stored DTCs)

Stored DTCs are displayed and printed out one after the other.

- Check printout against DTC table and repair all malfunctions as necessary ⇒ [page 01-9](#) .

No DTC recognized!



Rapid data transfer

HELP

Select function XX



If "No DTC recognized" is displayed the program will return to the starting point ("Select function XX" prompt) after the → button is pressed.



Indicated on display

If anything else is displayed:

⇒ *Scan Tool operating instructions*

- End output (function 06) ⇒ [page 01-18](#) .
- Switch ignition off and disconnect connections from Data Link Connector (DLC).

Diagnostic Trouble Code (DTC) table for radio system

Notes:

- ◆ *The following table lists all the malfunctions (stored as Diagnostic Trouble Codes, or DTCs) that can be recognized by the radio system and printed out by the VAG1551 Scan Tool (ST). The DTCs are listed in order according to their 5-digit numbers.*
- ◆ *The DTCs only appear on the print-out from the scan tool.*
- ◆ *Before replacing a component shown as faulty, check the wiring and connections to the component as well as Ground (GND) connections according to the wiring diagram.*
- ◆ *When a repair has been carried out, the DTC memory must always be checked again and then erased using the VAG1551 scan tool.*
- ◆ *Static and sporadic malfunctions are stored as DTCs in the DTC memory. If a malfunction occurs and persists for at least 2 seconds, it is identified as a static malfunction. If the malfunction does not occur again it is registered as a sporadic malfunction and "/SP" will appear at the right of the display.*
- ◆ *When the ignition is switched on, all existing malfunctions are automatically re-classified as sporadic malfunctions and will only be registered as static malfunctions if they still occur after testing.*
- ◆ *Sporadic malfunctions which no longer occur after 50 driving cycles (ignition on for at least 5 minutes, road speed of more than 30 km/h or 19 mph) are erased automatically.*

01-10

DTC	Possible cause	Corrective action
VAG1551 Scan Tool display		
00668 Battery Positive Voltage (B+) Term. 30 ♦ Signal too low	♦ Battery discharged or faulty ♦ Short circuit in vehicle electrical system	- Charge or replace battery. - Repair short circuit in vehicle electrical system.
00849 S Contact on Ignition Starter Switch ♦ Open circuit	♦ Ignition/starter switch -D- faulty ♦ Open circuit in wiring	- Replace ignition/starter switch -D-. - Trace malfunction using wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i>
00850 Control Output Active, Radio Amplifier ♦ Short circuit to Ground	♦ Wiring damaged ♦ Active amplifier faulty	- Trace malfunction using wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i> - Replace active amplifier.

01-11

DTC VAG1551 Scan Tool display	Possible cause	Corrective action
00852 Loudspeaker front ◆ Short circuit ◆ Open circuit	◆ Wiring damaged ◆ Front loudspeaker faulty ◆ Open circuit in wiring	- Trace malfunction using wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i> - Replace faulty loudspeaker. - Repair open circuit.
00853 Loudspeaker rear ◆ Short circuit ◆ Open circuit	◆ Wiring damaged ◆ Rear loudspeaker faulty ◆ Open circuit in wiring	- Trace malfunction using wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i> - Replace faulty loudspeaker. - Repair open circuit.

01-12

DTC	Possible cause	Corrective action
VAG1551 Scan Tool display		
00854 Output Radio Display Dash Panel Insert ♦ No signal	♦ Open circuit in wiring ♦ Instrument cluster combination processor faulty	- Trace malfunction using wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i> - Replace faulty instrument cluster. ⇒ <i>Repair Manual, Electrical Equipment, Repair Group 90; removing and installing instrument cluster</i>
00855 Connection to CD Changer ♦ No signal	♦ Open circuit in wiring ♦ Voltage supply to CD changer unit interrupted ♦ CD changer unit -R41- faulty	- Trace malfunction using wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i> - Check voltage supply to CD changer unit using wiring diagram. - Replace CD changer unit.

01-13

DTC VAG1551 Scan Tool display	Possible cause	Corrective action
00856 Radio Antenna ◆ Short circuit ◆ Open circuit	◆ Open circuit in wiring ◆ Short circuit in antenna wire	- Trace malfunction using wiring diagram. ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i> - Check antenna wire.
01044 Control Module incorrectly coded	◆ Radio not coded to match configuration in vehicle	- Code radio according to vehicle.
65535 Control Module Malfunctioning	◆ Radio faulty	- Replace radio.

01-14

Output Diagnostic Test Mode (scan tool function 03)

Notes:

- ◆ *The output Diagnostic Test Mode (DTM) may only be carried out with the vehicle stationary and the engine not running.*
- ◆ *Any malfunctions identified by the output Diagnostic Test Mode (DTM) must be traced and eliminated.*

The output DTM is used to test the loudspeaker wiring and the secondary display.

Carrying out output DTM

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode" function 03.

Rapid data transfer Q
03 - Output Diagnostic Test Mode



Indicated on display

- Press -Q- button to confirm input.

Output Diagnostic Test Mode →
Speaker



Indicated on display

All loudspeakers will receive a brief electrical pulse (inaudible).

01-15

Note:

Any malfunctions (e.g. short circuits) that occur will be recorded as DTCs in DTC memory.

- Press → button.



Indicated on display

"DISPLAY ... TEST" will appear on the secondary display in the instrument cluster.

- Press → button.



Indicated on display

- Press → button (returns scan tool to "Select function XX" prompt).



Indicated on display

Output Diagnostic Test Mode →
Outlet Radio display instrument panel insert

Output Diagnostic Test Mode →
End

Rapid data transfer HELP
Select function XX

Erase DTC Memory (scan tool function 05)

Note:

DTC memory can be erased only after it has been checked (⇒ [page 01-7](#)). If DTC memory cannot be erased, again check DTC memory and repair any malfunctions.

Requirements

- DTC memory checked ⇒ [page 01-7](#)
- All malfunctions repaired

When DTC memory has been checked:



Indicated on display

- Press buttons -0- and -5- to select "Erase DTC Memory" function 05.

Rapid data transfer

HELP

Select function XX

01-17

Rapid data transfer Q
05 - Erase DTC Memory



Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer →
DTC Memory is erased!



Indicated on display

DTC memory is now erased.

- Press → button.

Rapid data transfer HELP
Select function XX



Indicated on display

Notes:

Attention! →
DTC Memory is not interrogated



◆ *This message indicates an error in the test sequence.*

Rapid data transfer →
DTC Memory is not interrogated



◆ *This message indicates an error in the test sequence.*

◆ *Adhere exactly to the test sequence: first check DTC memory, repair malfunctions as necessary, then erase DTC memory.*

01-18

End Output (scan tool function 06)

- Press buttons -0- and -6- to select "End Output" function 06.

Rapid data transfer Q
06 - End Output



Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer HELP
Insert address word XX



Indicated on display

- Switch ignition off.
- Disconnect VAG1551 Scan Tool (ST) from Data Link Connector (DLC).

Code Control Module (scan tool function 07)

This function is used to code the radio for the following:

- ◆ Radio configuration
- ◆ Sound system
- ◆ Number of passive loudspeakers
- ◆ Country identification

Notes:

- ◆ *The coding procedure is used to set the various radio configuration options.*
- ◆ *The coding table only gives the combinations that are available for the Audi A4.*
- ◆ *The term "antenna with remote power supply" refers to active antennas (e.g. rear window antennas) which are powered via the HF cable.*
- ◆ *The coding must always correspond to the equipment installed in the vehicle.*

01-20

Coding procedure

Rapid data transfer	HELP
Select function XX	



Indicated on display

- Press buttons -0- and -7- to select "Code Control Module" function 07.

Rapid data transfer	Q
07 - Code Control Module	



Indicated on display

- Press -Q- button to confirm input.

Code Control Module	Q
Input code number XXXXX	06812



Indicated on display

- Input code number per coding table ⇒ [page 01-22](#) .

Coding: 00017 (example)

- ◆ Country identification: 0 = standard
 - ◆ Sound coordination: 0 = standard
 - ◆ Number of passive loudspeakers: 0 = no passive loudspeakers (BOSE sound system)
 - ◆ Sound system: 1 = BOSE sound system
 - ◆ Radio configuration: 7 = radio system with CD changer unit and secondary display
- Press -Q- button to confirm input.

01-21

4B0035186A	Radio	D01	→
Coding 00017	WSC 06812		

⏪ Indicated on display (the control module identification and the coding that was input)

- Press → button to end coding.

Rapid data transfer	HELP
Select function XX	

⏪ Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.

Rapid data transfer	Q
06 - End Output	

⏪ Indicated on display

- Press -Q- button to confirm input.

01-22

Radio coding table

5	4	3	2	1	← Decimal places of byte coding on scan tool display			
				7	Radio configuration			
						Antenna with remote power supply	CD changer unit	Secondary display
					1	X	-	-
					3	X	X	-
					5	X	-	X
					7	X	X	X
					X = component installed			

01-23

Radio coding table (cont'd)

5	4	3	2	1	← Decimal places of byte coding on scan tool display	
			1		Sound system adjustment	
					Type of adjustment	
				0	Standard (no BOSE sound system)	
				1	BOSE sound system	
		0			Number of passive loudspeakers	
					Number and locations	
				0	No passive loudspeakers (BOSE sound system)	
				1	1 passive loudspeaker, front-left (BOSE with telephone)	
				2	2 passive loudspeakers (front) and 2 active loudspeakers (rear)	
				5	2 passive loudspeakers (front) and no active loudspeakers (rear)	

01-24

Radio coding table (cont'd)

5	4	3	2	1	← Decimal places of byte coding on scan tool display	
	0				Sound matching	
				0	Standard	
0					Country identification	
					Country	
				0	Standard	

Read Measuring Value Block (scan tool function 08)

Carrying out "Read Measuring Value Block" function 08

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08.

Rapid data transfer Q
08 - Read Measuring Value Block



Indicated on display

- Press -Q- button to confirm input.

Read Measuring Value Block HELP
Input display group number XXX



Indicated on display

- Input display group number (from table ⇒ [page 01-26](#)) and press -Q- button to confirm input.

The measuring value block which has been selected will appear in the standard format.

01-26

Summary of display groups

Display group No.	Indicated on display
001	1 = Speed signal from speedometer 2 = Battery Positive Voltage (B+), terminal 30 3 = Radio illumination dimming in % 4 = S-contact status
002	1 = Front loudspeakers 2 = Front loudspeakers status 3 = Rear loudspeakers 4 = Rear loudspeakers status
003	1 = Type of antenna 2 = Antenna 3 = Antenna status
004	1 = Active speaker control output 3 = Telephone

	4 = Telephone mute input status
005	1 = CD connection 2 = CD connection status
006	1 = Secondary display (in instrument cluster) 2 = Secondary display status

01-27

Display group 001

Read Measuring Value Block 1 → ◀ Indicated on display

0 12.3 V 60 % ON

S-contact status

- Can be checked while measuring values are being displayed
- Ignition key withdrawn: display reads "OFF"
- S-contact reactivated: display reads "ON"

Dimming level of radio illumination in percent (only with light "ON")

- 0-99%

Battery Positive Voltage (B+), terminal 30

(measurement taken after electrical filter)

Vehicle speed signal from speedometer

- 0 or 1 (4 impulses per wheel revolution)

01-28

Display group 002

Read Measuring Value Block 2



◀ Indicated on display

Front speaker OK Rear speaker OK

Rear loudspeaker status

- OK
- Short circuit
- Open circuit

Rear loudspeakers

Front loudspeakers status

- OK
- Short circuit
- Open circuit

Front loudspeakers

01-29

Display group 003

Read Measuring Value Block 3 → ◀ Indicated on display

active

Antenna

OK

Antenna status

- OK
- Short circuit
- Open circuit

Antenna

Antenna type

- Passive
- Active (e.g. rear window antenna)

Display group 004

Read Measuring Value Block 4 → ◀ Indicated on display

0

Telephone

ON

Telephone mute input status

- Telephone in use = "ON"
- Telephone switched off = "OFF"

Telephone

Active amplifier control output status

- 0 = Status OK
- 1 = Short circuit to Ground (GND)

01-31

Display group 005

Read Measuring Value Block 5 → ◀ Indicated on display

CD connection

OK



CD connection status

- OK
- Not OK

CD connection

Display group 006

Read Measuring Value Block 6 → ◀ Indicated on display

Ext. Displ.

OK



Condition of secondary display

- OK
- Not OK

Secondary display (in instrument cluster)

01-79

Instrument cluster with long service life, On Board Diagnostic (OBD) (from m.y. 2000)

General information

Technical features of the instrument cluster

The instrument cluster is equipped with a service display which can process flexible data, that is, the instrument cluster evaluates various vehicle based service requirements on input quantities such as driveability or oil consumption.

The long service life is capable of reproducing the functions of the standard SRI, when the limits are set correctly. The limits are variable (in U.S. with set limits ⇒ Table ⇒ [Page 01-80](#)).

It is also possible to evaluate the oil temperature sensor. Adaptation channels in the VAG On Board Diagnostic (OBD) make this possible.

In countries where the standard Service Reminder Indicator (SRI) values are still used, such as the USA, the following constant adaptation values must be entered:

Table for Service Reminder Indicator values without long service life

Channel 42 (minimum mileage performance)	8000 miles
Channel 43 (maximum mileage performance)	8000 miles
Channel 44 (maximum time interval until next service)	365 days
Channel 45 (oil quality)	1

01-81

The Audi A4 instrument cluster is offered with a Midline version with Minicheck system and the Highline version with Driver Information System (DIS).

The instrument cluster in the Audi S4 is only offered with the Highline version with Driver Information System.

The speedometer contains an LCD display for the odometer and trip odometer.

A LCD display for LCD-clock/date is located in the tachometer.

The service reminder indicator is displayed in the center display.

The warning/ indicator lights are integrated in the speedometer and tachometer.

Details about the instrument cluster

⇒ *Operating instructions Audi A4 or Audi S4*

The instrument cluster is controlled by a microprocessor and has extensive On Board Diagnostic (OBD) capabilities. If malfunctions occur in any of the system components, corresponding Diagnostic Trouble Codes (DTC) are stored in the DTC memory of the instrument cluster. These can then be identified using the VAG1551 or VAG1552 Scan Tool (ST).

Note:

The description in this repair manual only refers to the VAG1551 Scan Tool (ST).

Malfunction message "dEF" on trip odometer display

If the control module in the instrument cluster detects a malfunction in its permanent memory, the letters "dEF" will appear on the trip odometer display.

- If "dEF" is indicated on display, replace instrument cluster ⇒ [Page 90-27](#) .

Notes for replacing instrument cluster

- ◆ Do not disassemble instrument cluster.
- ◆ If necessary, instrument cluster should be replaced through the exchange loop.
- ◆ Fill out a damage report form and return together with faulty instrument cluster.
- ◆ Faulty units must always be returned in original packaging.
- ◆ The odometer and the Service Reminder Indicator (SRI) of the replacement instrument cluster can be adapted using the VAG1551 Scan Tool (ST) ⇒ [Page 01-133](#) .

On Board Diagnostic (OBD), initiating program

Additional information

- ◆ Electrical Wiring Diagrams, Troubleshooting & Component Locations
- ◆ Service tools handbook
- ◆ Parts catalog

Safety precautions

If special testing equipment is required during road test, note the following:

WARNING!

- ♦ *Adhere to the following to avoid risk of accident during measurements while driving and road tests:*
- ♦ *Only use VAS5051 or VAG1551 to read out measuring value blocks. The tester must be secured to the rear seat and operated from there by a second technician.*

To reduce the risk of personal injury and/or damage of electric and electronic components, always observe the following:

- ♦ Always switch ignition off before connecting or disconnecting test/measurement tools.
- ♦ It is possible that the control module will recognize a malfunction and store a DTC during some tests. After completing all tests and repairs, DTC memory should therefore be checked and erased if necessary.
- ♦ Always switch ignition off before disconnecting

or connecting battery. Failure to do so may damage a control module.

Test requirements:

- ◆ Check fuse for function according to wiring diagram.
- ◆ Always check coding of instrument cluster according to code table ⇒ [Page 01-112](#) .
- ◆ Connect VAS5051 tester or VAG1551 scan tool ⇒ [Page 01-241](#) .
- ◆ Switch on ignition.

Notes:

- ◆ *If nothing is indicated on display, check voltage supply for VAG 1551 scan tool according to wiring diagram.*
- ◆ *Additional instructions can be called up via the HELP button on the scan tool.*
- ◆ *The → button is used for advancing through the program sequence.*
- ◆ *An incorrect entry can be canceled using the C button.*

- ◆ *Function 00 "Automatic test sequence" can be performed in operating mode 1 "Rapid data transfer". This automatically checks all control modules installed in the vehicle.*

01-87

- Switch on ignition.
- Switch printer on via the PRINT button (indicator lamp in button lights up).
- Press button -1- to select "Rapid data transfer" operating mode 1.

Rapid data transfer **HELP**
Insert address word XX



Indicated on display

Address word: 17

- Press buttons -1- and -7-.

Rapid data transfer **Q**
17 - Instrument cluster



Indicated on display:

- Press -Q- button to confirm input.

8D0920830... B5-INSTR. Clstr M73 D08 →
Coding 02242 WSC 06812



Indicated on display after approx. 5 seconds:

- ◆ 8D0920830...: Part number of instrument cluster (see also parts catalog)
- ◆ B5-INSTRUMENT CLUSTER component marking
- ◆ VDO: Manufactured by VDO (M73 : Manufactured by Magneti Marelli)
- ◆ D08: Software version of instrument cluster
- ◆ Coding 02242: Coding of instrument cluster
- ◆ WSC 06812: dealership number

Note:

Check code number according to coding table ⇒ [Page 01-112](#) .

- Press → button.

01-89

Rapid data transfer **HELP**
Control module does not answer



If one of these messages is displayed, perform trouble shooting according to troubleshooting diagnostic.

Rapid data transfer **HELP**
Malfunction in communication setup

⇒ Electrical Wiring Diagrams, Troubleshooting & Component Locations

Rapid data transfer **HELP**
K-wire does not switch to Ground

Rapid data transfer **HELP**
K-wire does not switch to Plus

Rapid data transfer

HELP

Select function XX



Indicated on display

- Pressing the HELP button will print out an overview of all of the possible functions.

On Board Diagnostic (OBD) functions

The following functions are possible:

02 - Check DTC Memory ⇒ [Page 01-91](#) .

03 - Output Diagnostic Test Mode ⇒ [Page 01-101](#) .

05 - Erase DTC Memory ⇒ [Page 01-107](#) .

06 - End Output ⇒ [Page 01-109](#) .

07 - Code Control Module ⇒ [Page 01-110](#) .

08 - Read Measuring Value Block ⇒ [Page 01-114](#) .

10 - Adaptation ⇒ [Page 01-133](#) .

Check DTC Memory (scan tool function 02)

Note:

The displayed DTC information is updated only when initiating OBD or with "Erase DTC Memory" function 05.

- Switch printer on via the PRINT button (indicator lamp in button lights up).

Rapid data transfer **HELP**
Select function XX



Indicated on display

- Press buttons -0- and -2-. This selects "Check DTC memory", function 02.

Rapid data transfer **Q**
02 - Check DTC memory



Indicated on display

- Press -Q- button to confirm input.

X DTC recognized!



The number of stored malfunctions appears in the display.

The stored malfunctions are displayed and printed out one after the other.

- Check print-out against DTC table and repair malfunction ⇒ [Page 01-93](#).

01-92

No DTC recognized!



Rapid data transfer

HELP

Select function XX



If "No DTC recognized!" is displayed, the program will return to "Select function XX" after the → button is pressed.



Indicated on display

If something else is displayed:

⇒ *Operating instructions of Scan Tool (ST)*

- End Output (function 06) ⇒ [Page 01-109](#)
- Switch off ignition and disconnect diagnostic connector.

Diagnostic Trouble Code (DTC) table for instrument cluster

Notes:

- ◆ *The following table lists all malfunctions that can be recognized by the instrument cluster and printed out by the VAG1551 scan tool. The malfunctions are listed in order according to their 5-digit numbers.*
- ◆ *DTC numbers appear only on the print-out.*
- ◆ *Before replacing a component shown as faulty, check the wiring and connections to the component as well as the Ground (GND) connections according to wiring diagram.*
- ◆ *After repairs and function test of the system, DTC memory must always be checked again using the VAG1551 scan tool and erased.*
- ◆ *DTC memory stores all static and sporadic malfunctions: If a malfunction occurs and persists for at least 2 seconds, it is identified as a static malfunction (outside temperature malfunction at least 60 seconds, coolant temperature sensor only after at least 30 minutes with engine running). If a malfunction does not occur again, it is registered as sporadic. "/SP" will appear at right on scan tool display.*
- ◆ *When the ignition is switched on, all existing malfunctions are automatically re-classified as sporadic malfunctions and will only register as static malfunctions if they still occur after testing.*
- ◆ *Sporadic malfunctions which no longer occur during 50 driving cycles (ignition on at least 5 minutes, vehicle speed 30 km/h) are erased automatically.*

01-94

VAG 1551 scan tool display	Possible causes	Corrective action
00562 Oil level thermal sensor - G266- ♦ Open circuit/short circuit to B+ ♦ Short circuit to Ground ♦ Implausible signal	♦ Open circuit or short circuit between oil level thermal sensor -G266- and instrument cluster ♦ Oil level thermal sensor -G266- faulty -G266- faulty ♦ Electronic part in sensor faulty	- Locate malfunction using wiring diagram - Repair open circuit - Oil level thermal sensor -G266- faulty Replace - G266-
00667 Outside temperature signal ♦ Open circuit/short circuit to B+ ♦ Short circuit to Ground ♦ implausible signal (is indicated incorrectly and must be disregarded)	♦ Open circuit or short circuit between instrument cluster and A/C control head -E87- ♦ A/C control head -E87- faulty	- Locate malfunction using wiring diagram - Repair open circuit - A/C system OBD ⇒ Repair Manual, Heating & AirConditioning, Repair Group 01
00668 Vehicle voltage, terminal 30 ♦ Voltage supply too low	♦ Battery was disconnected ♦ Open circuit or short circuit to a control module or sensor	- Perform automatic test sequence in order to determine the control module responsible for the DTC ⇒check voltage supply of malfunctioning control module - Locate malfunction using wiring diagram

		- Repair open circuit - Erase DTC memory and observe vehicle further

01-95

VAG 1551 scan tool display	Possible causes	Corrective action
00771 Sender for fuel gauge -G- ♦ Open circuit/short circuit to B+ ♦ Short circuit to Ground	♦ Open circuit or short circuit between sender for fuel gauge -G- (Front Wheel Drive/All Wheel Drive) and instrument cluster ♦ Sender for fuel gauge -G- (Front Wheel Drive/All Wheel Drive) is faulty	- Locate malfunction using wiring diagram - Repair open circuit - - Replace Sender for fuel gauge -G- (Front Wheel Drive/All Wheel Drive)
00779 Outside air temperature sensor -G17- ♦ Open circuit/short circuit to B+ ♦ Short circuit to Ground	♦ Open circuit or short circuit ♦ Outside air temperature sensor -G17- faulty	- Locate malfunction using wiring diagram - Repair open circuit - Replace outside air temperature sensor -G17-
01039 Engine Coolant Temperature (ECT) sensor -G2- ♦ Open circuit/short circuit to B+ ♦ Short circuit to Ground	♦ Open circuit or short circuit between Engine Coolant Temperature (ECT) sensor -G2- and instrument cluster ♦ Engine Coolant Temperature (ECT) sensor -G2- faulty	- Locate malfunction using wiring diagram - Repair open circuit - Replace Engine Coolant Temperature (ECT) sensor -G2-

01-96

VAG 1551 scan tool display	Possible causes	Corrective action
01300 Control module for navigation with CD mechanism -J401- ♦ no communication	♦ Open circuit or short circuit ♦ Incorrect control module, that is, control module does not support CAN ♦ A control module that supports CAN is not indicated with a "1" in measuring value block ⇒ Page 01-132 If control module for navigation with CD-mechanism -J401- is not displayed with "1" ♦ Adaptation for the instrument cluster was not performed properly	- Locate malfunction using wiring diagram - Repair open circuit - Replace control module with a control module that supports CAN - Select adaptation channel 62 and input the correct adaptation value ⇒ Page 01-190 .
01304 Radio ♦ no communication	♦ Open circuit or short circuit ♦ Incorrect control module, that is, control module does not support CAN ♦ A control module that supports CAN is not indicated with a "1" in measuring value block ⇒ Page 01-132 . ♦ Adaptation for the instrument cluster was not performed properly	- Locate malfunction using wiring diagram - Repair open circuit - Replace control module with a control module that supports CAN - Select adaptation channel 62 and input the correct adaptation value ⇒ Page 01-190 .

01-97

VAG 1551 scan tool display	Possible causes	Corrective action
01311 Data-BUS information ♦ faulty ♦ in single wire mode	♦ Open circuit or short circuit to a control module in information data-BUS ♦ Incorrect control module in information data-BUS, that is, control module does not support CAN. ♦ A control module that supports CAN is not indicated with a "1" in measuring value block ⇒ Page 01-132 . ♦ During adaptation of the instrument cluster, a control module that supports CAN was not concurrently adapted ♦ Data bus is operating on only one wire (this can cause EMV problems)	- Locate malfunction using wiring diagram - Repair open circuit - Replace control module with a control module that supports CAN - Select adaptation channel 62 and input the correct adaptation value ⇒ Page 01-190 . - Check data exchange ⇒ Page 01-196 .

01-98

VAG 1551 scan tool display	Possible causes	Corrective action
01312 Powertrain data-BUS ♦ faulty	♦ Open circuit or short circuit to a control module in powertrain data-BUS ♦ A control module in the powertrain data-BUS is incorrect, that is, control module does not support CAN ♦ A control module that supports CAN is not indicated with a "1" in measuring value block ⇒ Page 01-129 . ♦ During adaptation of the instrument cluster, a control module that supports CAN was not concurrently adapted	- Locate malfunction using wiring diagram - Repair open circuit - Replace incorrect control module with a control module that supports CAN - Select adaptation channel 60 and input the correct adaptation value ⇒ Page 01-183 .
01314 Engine Control Module (ECM) ♦ no communication	♦ Open circuit or short circuit ♦ Incorrect control module, that is, control module does not support CAN ♦ A control module that supports CAN is not indicated with a "1" in measuring value block ⇒ Page 01-129 If Engine Control Module (ECM) is not displayed with "1" ♦ Adaptation for the instrument cluster was not performed properly	- Locate malfunction using wiring diagram - Repair open circuit - Replace control module with a control module that supports CAN - Select adaptation channel 60 and input the correct adaptation value ⇒ Page 01-183 .

01-99

VAG 1551 scan tool display	Possible causes	Corrective action
01315 Transmission Control Module (TCM) ♦ no communication	♦ Open circuit or short circuit ♦ Incorrect control module, that is, control module does not support CAN ♦ A control module that supports CAN is not indicated with a "1" in measuring value block ⇒ Page 01-129 . ♦ Adaptation for the instrument cluster was not performed properly	- Locate malfunction using wiring diagram - Repair open circuit - Replace control module with a control module that supports CAN - Select adaptation channel 60 and input the correct adaptation value ⇒ Page 01-183 .
01320 Climatronic control module -J255- ♦ no communication	♦ Open circuit or short circuit ♦ Incorrect control module, that is, control module does not support CAN ♦ A control module that supports CAN is not indicated with a "1" in measuring value block ⇒ Page 01-130 If climatronic control module -J522- is not displayed with "1" ♦ Adaptation for the instrument cluster was not performed properly	- Locate malfunction using wiring diagram - Repair open circuit - Replace control module with a control module that supports CAN - Select adaptation channel 60 and input the correct adaptation value ⇒ Page 01-183 .

01-100

VAG 1551 scan tool display	Possible causes	Corrective action
01336 Comfort system data-BUS ♦ faulty ♦ in single wire mode	♦ Open circuit or short circuit to a control module in comfort system data-BUS ♦ A control module in the comfort system data-BUS is incorrect, that is, the control module does not support CAN ♦ A control module that supports CAN is not indicated with a "1" in measuring value block ⇒ Page 01-131 . ♦ During adaptation of the instrument cluster, a control module that supports CAN was not concurrently adapted ♦ Data bus is operating on only one wire (this can cause EMV problems)	- Locate malfunction using wiring diagram - Repair open circuit - Replace control module with a control module that supports CAN - Select adaptation channel 61 and input the correct adaptation value ⇒ Page 01-187 . - Check data exchange ⇒ Page 01-196 .
01402 Data wire from navigation ♦ Unplausible signal	♦ Open circuit in clock, enable or data wire ♦ Problem in interface between navigation and instrument cluster ♦ Disturbance due to electromagnetic radiation inside and outside vehicle	- Check cabling of data wires for damage - Check for cause of electromagnetic disturbance ⇒ Repair Manual, Radio, Telephone, Navigation, Repair Group 91 - Repair open circuit
65535 Control module	Instrument cluster faulty	- Replace instrument cluster ⇒ Page 90-27 .

faulty		

01-101

Output Diagnostic Test Mode (scan tool function 03)

Notes:

- ◆ Output Diagnostic Test Mode is only possible when vehicle is stationary and engine is not running!
- ◆ If malfunctions are found during output Diagnostic Test Mode, determine cause of malfunction and replace instrument cluster if necessary.

During the "output Diagnostic Test Mode" function, all actuators that are installed in the instrument cluster and coded are activated in sequence.

- ◆ There is also a simultaneous parallel sweep through the indicator range of all analog display instruments (Engine Coolant Temperature (ECT) gauge, tachometer, speedometer, fuel gauge)
- ◆ Activation of warning lamps
- ◆ Activation of seat belt warning light

- ◆ Activation of chime
- ◆ Segment test of driver information system, LCD clock/date display, and LCD trip odometer and daily odometer.

01-102

- ◆ Test of instrument cluster lighting, including dimmer

Note:

Test can only be performed with lights switched on.

Initiating output Diagnostic Test Mode:

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -3-. This selects "output Diagnostic Test Mode (DTM)", function 3.

Rapid data transfer Q
03 - Output Diagnostic Test Mode



Indicated on display:

- Press -Q- button to confirm input. Output Diagnostic Test Mode for analog displays is initiated immediately.

Output Diagnostic Test Mode 
Analog displays



Indicated on display:

01-103

The following tests are performed simultaneously:

- ◆ Sweep of coolant temperature needle through entire display range
- ◆ Sweep of tachometer needle through entire display range
- ◆ Sweep of speedometer needle through entire display range
- ◆ Sweep of fuel gauge needle through entire display range

After sweep of display ranges, the following fixed values are displayed:

Engine Coolant Temperature (ECT) gauge:	$\frac{1}{2}$
Tachometer:	3000 RPM
Speedometer:	62 MPH
Fuel gauge:	$\frac{1}{2}$

Note:

Switching ignition on and off will stop any needle

sweep that has started.

- Press → button.

01-104

Output Diagnostic Test Mode →
Warning lamp test for instrument cluster



Indicated on display:

All lamps are switched on that are activated by the processor.

- Press → button.

Output Diagnostic Test Mode →
Seat belt warning light -K19



Indicated on display:

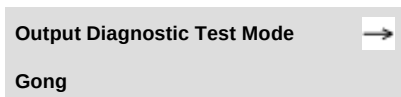
Seat belt warning light is activated.

Note:

Depending on options/versions, the seat belt warning light may be activated by the control module coding, that is, if this actuator test is omitted, the warning light is not active.

- Press → button.

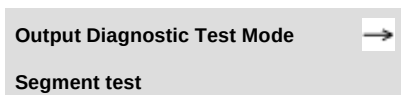
01-105



Indicated on display:

Chime is activated and sounds the entire time.

- Press → button.

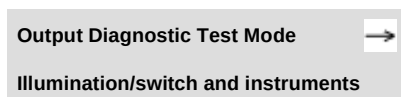


Indicated on display:

All display points of the driver information display, the LCD clock/date indicator and the LCD odometer and daily odometer are activated.

- Press → button.

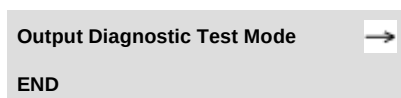
01-106



◀ Indicated on display:

Instrument cluster illumination is automatically set twice to bright and dark and then switched to maximum illumination (bright).

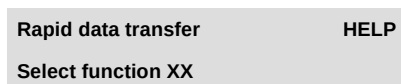
- Press → button.



◀ Indicated on display:

- Press → button to end output Diagnostic Test Mode.

The tester returns to the "Select function" mode.



◀ Indicated on display

Erase DTC Memory (scan tool function 05)

Note:

If DTC memory cannot be erased, check DTC memory again and repair malfunction.

Requirements

- ◆ DTC memory checked ⇒ [Page 01-91](#) .
- ◆ All malfunctions repaired.

After successful DTC memory check:



Indicated on display

- Press buttons -0- and -5-. This selects "Erase DTC memory", function 05.

Rapid data transfer
Select function XX

HELP

01-108

Rapid data transfer Q
05 Erase DTC memory

- ⏮ Indicated on display
- Press -Q- button to confirm input.

Rapid data transfer →
DTC memory is erased!

- ⏮ Indicated on display
- DTC memory is erased.
- Press → button.

Rapid data transfer HELP
Select function XX

- ⏮ Indicated on display

Notes:

CAUTION!
DTC memory was not checked

- ⏮ ♦ *Test sequence is faulty if this message is displayed.*

Rapid data transfer →
DTC memory was not checked

- ⏮ ♦ *Test sequence is faulty if this message is displayed.*

Follow test sequence exactly: first check DTC memory, repair malfunction (s) if necessary, then erase.

01-109

End Output (scan tool function 06)

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -6-. This selects "End Output", function 06.

Rapid data transfer Q
06 End output



Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer HELP
Input address word XX



Indicated on display

- Switch off ignition.
- Disconnect harness connectors for the VAG1551 scan tool

Code Control Module (scan tool function 07)

Using this function, the instrument cluster can be coded as follows:

- ◆ Options
- ◆ Country versions
- ◆ Number of cylinders
- ◆ Engine versions

Notes:

- ◆ *Coding adjusts the various combination possibilities of the on board computer according to engine type, cylinder count and country version.*
- ◆ *Only the appropriate combinations for the Audi A4 or Audi S4 are mentioned in the coding table.*

01-111

Initiating coding

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -7-. This selects "Code Control Module", function 07.
- Press -Q- button to confirm input.

Rapid data transfer Q
07 Code control module



Indicated on display

- Press -Q- button to confirm input.

Code control module
Input code number XXXXX (0-32000)



Indicated on display:

- Input code number using coding table ⇒ [Page 01-112](#) . Example:
02242

02	Seat belt warning active
2	Country version US
4	4-cylinder
2	gas engine

Code control module Q
Input code number 02242 (0-32000)



Indicated on display:

- Press -Q- button to confirm input.

8D0920830... B5-INSTR. Clstr. M73 D08 
Coding 02242 WSC 06812



Indicated on display:

- Press → button.

01-112

Coding table:

XX			Optional equipment/transmission version
00			No additional equipment
02			Seat belt warning active
16			Navigation I and II
	X		Country version
	0		Germany (D)
	1		RdW Left Hand Drive
	2		USA (US)
	3		Canada (CDN)
	4		Great Britain (GB)
	5		Japan (JP)
	6		Saudi Arabia (SA)
	7		Australia (AUS)
	8		RdW Right Hand Drive
	9		JP Right Hand Drive (RHD) vehicles

Note:

Navigation I is the first generation navigation system in center display. Navigation II is the navigation system with the monitor in the center console.

01-113

		X		Cylinder count
		4		4-cylinder
		6		6-cylinder
			X	Engine versions
			0	TDI-engine
			2	gas engine
			4	Turbo-engine

Notes:

- ◆ *Coding can be modified to allow for various combinations of optional equipment, depending on what is installed in the vehicle.*
- ◆ *If vehicle is equipped with more than one item of optional equipment and/or transmission variant that needs to be coded, the overall coding will be the total of the individual coding numbers.*

Example:

- Seat belt warning active and navigation I 02
+ 16 = 18

Read Measuring Value Block (scan tool function 08)

Initiating "Read Measuring Value Block"

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -8-. This selects "Read measuring value block", function 08.
- Press -Q- button to confirm input.

Rapid data transfer Q
08 - Measured value block



Indicated on display

- Press -Q- button to confirm input.

Read measured value block
Input display group number XXX



Indicated on display:

- Enter display group number (from table ⇒ [Page 01-115](#)) and press -Q- button to confirm input.

The selected measuring value block is now displayed in standard form.

01-115

Display group overview:

Display group number	Indicated on display
001	1 = Speed 2 = Engine RPM 3 = Oil pressure switch 4 = Time
002	1 = Trip odometer 2 = Fuel gauge 3 = Tank sensor 4 = Outside air temperature
003	1 = Coolant temperature
010	1 = Channel 30 2 = Adaptation tank sensor 3 = Channel 9 4 = Trip odometer
011	1 = Channel 4

	2 = Language version
	3 = Channel 3
	4 = Consumption display

01-116

Display group number	Indicated on display
012	1 = Channel 40 2 = distance since service 3 = Channel 41 4 = Time since service
013	1 = Channel 42 2 = Minimum value miles 3 = Channel 43 4 = Maximum value miles
014	1 = Channel 44 2 = Max. time interval 3 = Unassigned 4 = Unassigned
015	1 = Channel 45 2 = Oil quality 3 = Channel 46

	4 = Total consumption quantity

01-117

Display group number	Indicated on display
050	1 = Trip odometer 2 = Engine RPM 3 = Oil temperature 4 = Coolant temperature
125	1 = Engine 2 = Transmission 3 = ABS 4 = ADR
126	1 = A/C
130	1 = Tire pressure 2 = Auxiliary heater 3 = Unassigned 4 = Parking assistance
140	1 = Radio 2 = Telephone 3 = Navigation

	4 = Telematic (Tele-data-processing)

01-118

Notes:

- ◆ *For an instrument cluster replacement, data from display groups 10...15 must be printed out.*
- ◆ *Measuring value blocks 125 and 126 indicate the participants in the powertrain data-BUS.*
- ◆ *Measuring value block 130 indicates the participants in the comfort system databus.*
- ◆ *Measuring value block 140 indicates the participants in the information data-BUS*
- ◆ *Display will always indicate the actual values obtained from the sensors. The values which appear on the instrument cluster are filtered and may be different.*
- ◆ *If the actual engine coolant temperature is between 80 °C and 100 °C, instrument cluster will always show 90 °C.*

01-119

Measuring value block 001

Read Measuring Value Block 1



◀ Indicated on display:

30 MPH 2400 RPM Oil p2 <min. 12: 20 h

Time

Oil pressure switch 2

- Oil p2 < min.
- Oil p2 OK

Engine speed (RPM)

- 0 - 9990 RPM

Speed

- 0 - 187 MPH

01-120

Measuring value block 2

Read Measuring Value Block 2



◀ Indicated on display:

6256 mi

43 l

82 Ohm

23.0 ° C

Outside air temperature

- -40 to +70 ° C

Tank sensor

- approx. 280 Ohm (empty) ... approx. 40 Ohm (full)

Fuel gauge

- 0 - 100 l

Display value of trip odometer

01-121

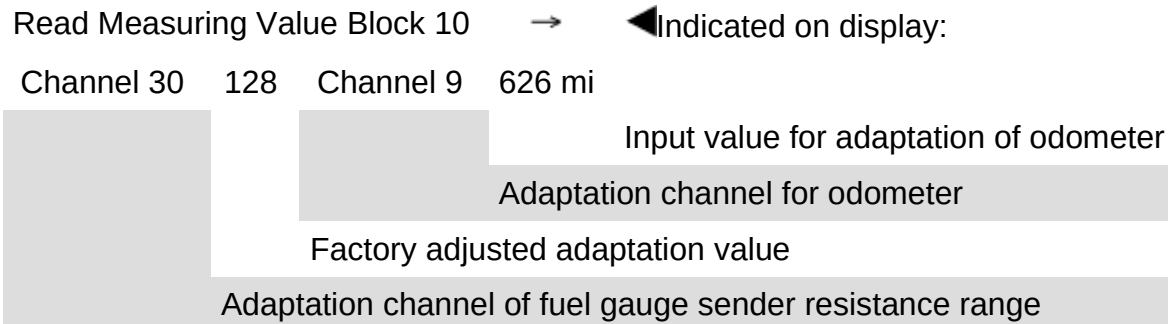
Measuring value block 3

Read Measuring Value Block 3 → ◀ Indicated on display:

85.0 ° C

Coolant temperature

• 50 - 130 ° C

Measuring value block 10**Note:**

If the value "128" in display field 2 was changed due to a customer complaint, the changed value must be transferred when replacing instrument cluster.

01-123

Measuring value block 11

Read Measuring Value Block 11		→	◀ Indicated on display:
Channel 4	2	Channel 3	100
		Factory adjusted adaptation value	
		Adaptation channel of fuel gauge	
		Selected language	
		• 1 is German • 2 is English	
		Adaptation channel for language version of driver information display	

Note:

If the value "100" in display field 4 was changed due to a customer complaint, the changed value must be transferred when replacing instrument cluster.

01-124

Measuring value block 12

Read Measuring Value Block 12 → Indicated on display:

Channel 40 8 Channel 41 10

Time expired

- For example, 10 means 10 days

Adaptation channel for time since service

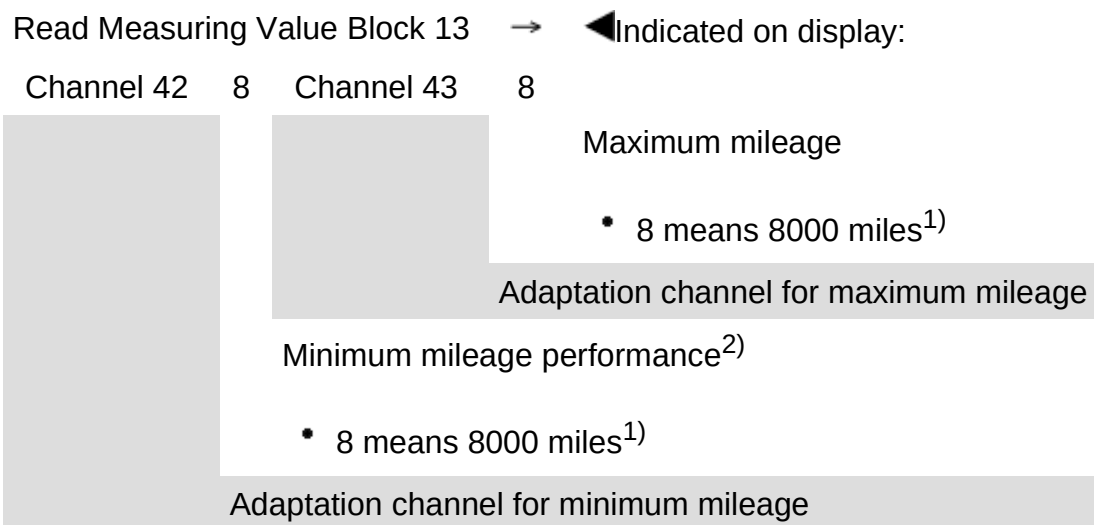
Driven miles

- 8 means 800 miles

Adaptation channel for distance driven since service

01-125

Measuring value block 13



Note:

¹⁾ The currently valid specifications can be found in the "Maintenance" book.

⇒ [Repair Manual, Maintenance](#)

²⁾ For USA-vehicles: For instrument cluster of the manufacturer Marelli, the starting value (first value of remaining distance without calculating) is set to 8000 miles. For instrument clusters of the manufacturer VDO, the starting value is set to 8100 miles. The 100 miles which are displayed in excess, are compensated during driving. For vehicles with 1.8 Liter Turbo engine, the starting value of 5000 is set. For both manufacturers 8000 or 8100 miles is displayed anyway. The damper action also occurs from the actual remaining interval during driving operation.

01-126

Measuring value block 14

Read Measuring Value Block 14 → ◀ Indicated on display:

Channel 44

365

Maximum time interval

- 365 means 365 days/1 year¹⁾

Adaptation channel for maximum time interval

Note:

¹⁾ The currently valid specifications can be found in the "Maintenance" book.

⇒ [Repair Manual, Maintenance](#)

01-127

Measuring value block 15

Read Measuring Value Block 15



◀ Indicated on display:

Channel 45 1 Channel 46 300

Total consumption quantity

- 300 means 300 liters

Adaptation channel for the total consumption quantity (gasoline engines only)

Oil quality

- Input of 1 to 4 possible ¹⁾
- The "1" is entered in the USA

Adaptation channel for oil quality

Notes:

- ◆ ¹⁾ The currently valid specifications can be found in the "Maintenance" book.

⇒ [Repair Manual, Maintenance](#)

- ◆ Oil quality must be re-adapted after every service.

01-128

Measuring value block 50

Read Measuring Value Block 50 → ◀ Indicated on display:

6256 mi 2400 RPM 99 ° C 85.0 ° C

Coolant temperature

• 50 - 130 ° C

Oil temperature

Engine speed (RPM)

• 0 - 9990 RPM

Display value of trip odometer

01-129

Measuring value block 125Read Measuring Value Block
125

→ ◀ Indicated on display:

Engine 1 Transmission 1

ADR - Display field for connecting powertrain data-BUS

- 1 - means the ADR control module is a participant in the powertrain data-BUS
- empty display field indicates ADR control module is not a participant in the powertrain data-BUS

ABS - Display field for connecting powertrain data-BUS

- 1 - means the ABS control module is a participant in the powertrain data-BUS
- empty display field indicates ABS control module is not a participant in the powertrain data-BUS

Transmission - Display field for connecting powertrain data-BUS

- 1 - means the Transmission Control Module (TCM) is a participant in the powertrain data-BUS
- empty display field indicates Transmission Control Module (TCM) is not a participant in the powertrain data-BUS

Engine - Display field for connecting powertrain data-BUS

- 1 - means the Engine Control Module (ECM) is a participant in the powertrain data-BUS

- empty display field indicates Engine Control Module (ECM) is not a participant in the powertrain data-BUS

01-130

Measuring value block 126

Read Measuring Value Block 126



◀ Indicated on display:

A/C 1

A/C - Display field for connecting powertrain data-BUS

- 1 - means the A/C control module is a participant in the powertrain data-BUS
- empty display field indicates A/C Control Module is not a participant in the powertrain data-BUS

01-131

Measuring value block 130

Read Measuring Value
Block 130

→ ◀ Indicated on display:

Parking assistance - display field for connecting comfort system data-BUS.

Connection

- 1- means the parking assistance control module is a participant in the comfort system data-BUS
- empty display field means the parking assistance control module is not a participant in the comfort system data-BUS

Auxiliary heater - display field for connecting the comfort system data-BUS

- 1- means the auxiliary heater control module is a participant in the comfort system data-BUS
- empty display field means the auxiliary heater control module is not a participant in the comfort system data-BUS

Tire pressure - display field for connecting the comfort system data-BUS

- 1- means the tire pressure control module is a participant in the comfort system data-BUS
- empty display field means the tire pressure control module is not a participant in the comfort system data-BUS

01-132

Measuring value block 140Read Measuring Value
Block 140

→ ◀ Indicated on display:

Telematic - Display field for connecting information data-BUS

- 1 - means the Telematic control module is a participant in the information data-BUS
- empty display field indicates Telematic control module is not a participant in the information data-BUS

Navigation - Display field for connecting information data-BUS

- 1 - means the navigation control module is a participant in the information data-BUS
- empty display field indicates navigation control module is not a participant in the information data-BUS

Telephone - Display field for connecting information data-BUS

- 1 - means the telephone control module is a participant in the information data-BUS
- empty display field indicates telephone control module is not a participant in the information data-BUS

Radio - Display field for connecting information data-BUS

- 1 - means the radio control module is a participant in the information data-BUS

- empty display field indicates radio control module is not a participant in the information data-BUS

Adaptation (scan tool function 10)

Individual functions are called up by entering the appropriate adaptation channel numbers (listed in the adaptation table ⇒ [Page 01-134](#)).

Notes:

- ◆ *Using measuring value blocks 10, 11, 12 and 15, the values that need to be transferred to the new instrument cluster can be read out before replacement.*
- ◆ *Adaptation channels 42, 43, and 44 (see measuring value blocks 013 and 014 ⇒ [Page 01-125](#) and ⇒ [Page 01-126](#)) must be adapted according to the oil quality (measuring value block 15 ⇒ [Page 01-127](#)).*
- ◆ *Adaptation channels 60, 61, and 62 are only needed when the instrument cluster communicates with the corresponding BUS system..*
- ◆ *Measuring value blocks 125 and 126 ⇒ [Page 01-129](#) and ⇒ [Page 01-130](#) indicate the components that are part of the powertrain data-BUS.*
- ◆ *Measuring value block 130 ⇒ [Page 01-131](#)*

indicates the components that are part of the comfort system data-BUS.

- ◆ *Measuring value block 140 ⇒ [Page 01-132](#) indicates the components that are part of the information data-BUS.*

Adaptation table:

Adaptation channel	Adaptation function
02	Resetting SRI after service ⇒ Page 01-136
03	Adaptation of fuel gauge ⇒ Page 01-140
04	Language version of driver information display ⇒ Page 01-143
09	Odometer ⇒ Page 01-148
18	Adaptation of auxiliary heater ⇒ Page 01-152
30	Adaptation of fuel gauge sender resistance range ⇒ Page 01-155
35	Adaptation of engine speed threshold ⇒ Page 01-158
40	Adaptation for distance driven since service ⇒ Page 01-161
41	Adaptation for time since service ⇒ Page 01-164
42	Adaptation for minimum mileage performance ⇒ Page 01-167
43	Adaptation for maximum mileage performance ⇒ Page 01-170
44	Adaptation for maximum time interval ⇒ Page 01-173
45	Adaptation for oil quality ⇒ Page 01-176
46	Adaptation for total consumption quantity (only gasoline engines) ⇒ Page 01-179
60	Adaptation powertrain data-BUS ⇒ Page 01-181
61	Adaptation comfort system data-BUS ⇒ Page 01-185
62	Adaptation information data-BUS ⇒ Page 01-188

Initiating "Adaptation" function 10

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -1- and -0-. This selects "Adaptation", function 10.
- Press -Q- button to confirm input.

Rapid data transfer Q
10 - Adaptation



Indicated on display

- Press -Q- button to confirm input.

Adaptation
Input channel number XX



Indicated on display:

- Enter desired adaptation channel (adaptation table ⇒ [Page 01-134](#)).
- Press -Q- button to confirm input.

Note:

After changing an adaptation value or ending an adaptation channel, "Adaptation" function 10 must be performed again before selecting another adaptation channel.

01-136

Rapid data transfer HELP
Select function XX

Rapid data transfer Q
10 - Adaptation

Adaptation
Input channel number XX

Resetting SRI after service



Indicated on display

- Press -1- and -0- and confirm by pressing the -Q- button.



Indicated on display

- Press -Q- button to confirm input.



Indicated on display:

- Press buttons -0- and -2-.
- Press -Q- button to confirm input.

Notes:

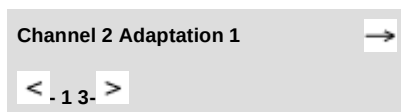
- ◆ *The Service Reminder Indicator (SRI) is used to remind the driver when a service is necessary. Indication is in center display.*
- ◆ *Service reminder appears 1 month or 1200 miles before service limit is reached. Resolution is 100 miles. Example for display: After a total driving distance of 7000 miles, "SERVICE IN 1000 miles" is indicated.*

- ◆ *The remaining distance to service can be checked via the menu in center display by pressing the clock set button once.*
- ◆ *When a service event arrives, the text information appears in the center display for 5 seconds when ignition is switched on. It is shown after the note for automatic transmission and a target input for navigation (if applicable). Display: "SERVICE".*
- ◆ *The currently valid specifications can be found in the "Maintenance" book.*

⇒ [Repair Manual, Maintenance](#)

- ◆ *Data version of instrument cluster ⇒ [Page 01-88](#).*
- ◆ *Channels 40, 41, and 46, which display the dynamic values of the service event are set to "0" automatically.*

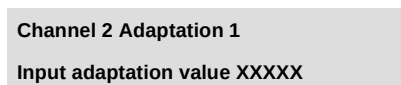
01-138



◀ Indicated on display: Service event is displayed

1 - means service is active, this means that "SERVICE!" is displayed in the instrument cluster.

- Press → button.



◀ Indicated on display:

Service event is reset using the following adaptation values:

Adaptation value	Service event
00000	Reset

- Using the keypad enter the appropriate adaptation value (00000) to erase the service.

- Press -0- button five times.

01-139

Channel 2 Adaptation 1 Q
Input adaptation value 00000



Indicated on display:

- Press -Q- button to confirm input.

Channel 2 Adaptation 0 Q
< . 1 3 . >



Indicated on display:

0 - means service is reset, meaning that "SERVICE in 8000 mi (Marelli instrument cluster) or 8100 mi (VDO instrument cluster)" is displayed in instrument cluster after confirming with Q button.

Note:

The display of 8000 or 8100 miles is the starting value for the service display.

- Press -Q- button to confirm input.

Channel 2 Adaptation 0 Q
Store changed value?



Indicated on display:

- Press -Q- button to confirm input.

Channel 2 Adaptation 0 →
Store changed value?



Indicated on display:

- Press the → button to complete the reset of the SRI.

01-140

Adaptation of fuel consumption display

Rapid data transfer HELP
Select function XX



Indicated on display

- Press -1- and -0- and confirm by pressing the -Q- button.

Rapid data transfer Q
10 - Adaptation



Indicated on display

- Press -Q- button to confirm input.

Adaptation
Input channel number XX



Indicated on display:

- Press buttons -0- and -3-.
- Press -Q- button to confirm input.

Notes:

- ◆ *Adaptation only for vehicles with on board computer.*
- ◆ *Value entered must be between 85% and 115%.*
- ◆ *Value must be entered in steps of 5%.*
- ◆ *If the value "100" was changed due to a customer complaint, the changed value must be transferred when replacing instrument cluster.*

Channel 3 Adaptation 100 →
Consumption display < 13 >



Indicated on display:

- Press → button.

01-141

Note:

Correction of fuel consumption display is only possible via direct input.

Channel 3 Adaptation 100
Input adaptation value XXXXX



Indicated on display:

- Input desired correction value using scan tool keypad, filling initial positions with "0".

Example:

Desired input value: 90%

Keypad input: 00090

Channel 3 Adaptation 100 Q
Input adaptation value 00090



Indicated on display:

- Press -Q- button to confirm input.

Channel 3 Adaptation 90 Q
Consumption display < - 1 3 - >



Indicated on display:

- Press -Q- button to confirm input.

Channel 3 Adaptation 90 Q
Store changed value?



Indicated on display:

- Press -Q- button to confirm input.

Channel 3 Adaptation 90 →
Changed value is stored



Indicated on display:

- Conclude adaptation of the fuel consumption display by pressing the →

button.

01-142

Rapid data transfer **HELP**
Select function XX



Indicated on display

- Press -1- and -0- and confirm by pressing the -Q- button.

Rapid data transfer **Q**
10 - Adaptation



Indicated on display

- Press -Q- button to confirm input.

Note:

If input is incorrect, tester switches to function mode.

Function is unknown or  cannot
be carried out at the moment



Indicated on display:

- Press  button.
- Select "Adaptation" function 10 again and select adaptation channel 03.
- Perform correction of fuel gauge again.

01-143

Language version of driver information display

Rapid data transfer HELP
Select function XX



Indicated on display

- Press -1- and -0- and confirm by pressing the -Q- button.

Rapid data transfer Q
10 - Adaptation



Indicated on display

- Press -Q- button to confirm input.

Adaptation
Input channel number XX



Indicated on display:

- Press buttons -0- and -4-.
- Press -Q- button to confirm input.

Channel 4 Adaptation 1 →
Language < - 1 3- >



Indicated on display:

Notes:

- ◆ Display indicates only the last digit of the five digit language version code, for example, 1 for German.
- ◆ If incorrect value is input "Adaptation" function is terminated and "Adaptation" function 10 must be initiated again.
- ◆ Code can now be entered using the scan tool keypad in steps or via direct input.

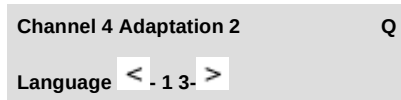
01-144**Coding table:**

Code	Language version
00001	German
00002	English
00003	French
00004	Italian
00005	Spanish
00006	Portuguese

01-145

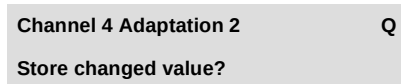
Input in steps:

- Code can be decreased using button 1 and increased using button 3, for example, to 2 for language version English.



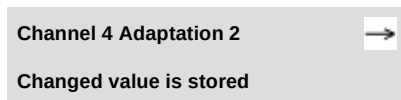
Indicated on display:

- Press -Q- button to confirm input.



Indicated on display:

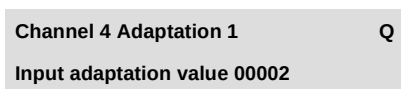
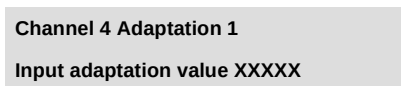
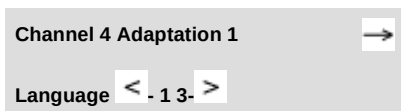
- Press -Q- button to confirm input.



Indicated on display:

- Conclude adaptation of language version by pressing the → button.

01-146



Direct input:



Indicated on display:

- Press → button.



Indicated on display:

- Input desired five digit code ⇒ [Page 01-144](#) Enter using keypad.

Example:

Coding: 2 (English)

Input value: 00002

- Press -Q- button to confirm input.



Indicated on display:

- Press -Q- button to confirm input.

01-147

Channel 4 Adaptation 2 Q
Language < - 1 3- >



Indicated on display:

- Press -Q- button to confirm input.

Channel 4 Adaptation 2 Q
Store changed value?



Indicated on display:

- Press -Q- button to confirm input.

Channel 4 Adaptation 2 →
Changed value is stored



Indicated on display:

- Conclude adaptation of language version by pressing the → button.

Odometer display

This function is used to adapt the odometer after the instrument cluster is replaced.

Notes:

- ◆ *The adaptation is only possible for an instrument cluster with a maximum mileage of 100 miles.*
- ◆ *Adaptation can only be performed once for each instrument cluster.*
- ◆ *Only larger adaptation values can be entered (more than 100 miles).*
- ◆ *If an incorrect value is entered and confirmed, it cannot be changed. If this happens, the instrument cluster must be replaced.*
- ◆ *In countries where speedometers are calibrated in miles, adaptation can be performed in miles.*
- ◆ *Observe notes when replacing instrument cluster ⇒ [Page 01-191](#) .*

01-149

Rapid data transfer **HELP**
Select function XX



Indicated on display:

- Press buttons -1- and 1-. This selects "Login Procedure" function 11.

Rapid data transfer **Q**
11 - Login-Procedure



Indicated on display:

- Press -Q- button to confirm input.

Login-Procedure
Input code number XXXXX



Indicated on display:

- Input code number 13861.

Login-Procedure **Q**
Input code number 13861



Indicated on display:

- Press -Q- button to confirm input.

Rapid data transfer **HELP**
Select function XX



Indicated on display:

- Press buttons -1- and -0-.

Rapid data transfer **Q**
10 - Adaptation



Indicated on display:

- Press -Q- button to confirm input.

Adaptation
Input channel number XX



Indicated on display:

- Press buttons -0- and -9-.

01-150

Channel 9 Adaptation 0 →

Mileage in 10 miles < 13 >

Channel 9 Adaptation 0 Q

Input adaptation value XXXXX

- Press -Q- button to confirm input.

◀ Indicated on display:

Note:

For the VAG1551 scan tool values can only be input via direct input.

- Press the → button to continue program sequence.

◀ Indicated on display:

- Input adaptation value (measuring value block 10 ⇒ [Page 01-122](#)) via the keypad.

Example:

Mileage = 89627

0 8 9 6 3

X					Hundred thousands: 100000 - 655350
	X				Ten thousands: 10000 - 90000
		X			Thousands: 1000 - 9000
			X		Hundreds: 100 - 900
				X	Tens: 10 - 90
					Ones: round to nearest ten

01-151

Channel 9 Adaptation 0 Q
Input adaptation value 08963



Indicated on display:

- Press -Q- button to confirm input.

Channel 9 Adaptation 8963 Q
Mileage in 10 miles < - 13 - >



Indicated on display:

- Press -Q- button to confirm input.

Channel 9 Adaptation 8963 Q
Store changed value?



Indicated on display:

- Press -Q- button to confirm input.

Channel 9 Adaptation 8963 →
Changed value is stored



Indicated on display:

- End adaptation of odometer by pressing the → button.

01-152

Adaptation of auxiliary heater

Rapid data transfer **HELP**
Select function XX



Indicated on display

- Press -1- and -0- and confirm by pressing the -Q- button.

Rapid data transfer **Q**
10 - Adaptation



Indicated on display

- Press -Q- button to confirm input.

Adaptation
Input channel number XX



Indicated on display:

- Press buttons 1- and -8-.
- Press -Q- button to confirm input.

01-153

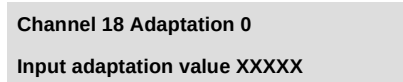


- Indicated on display: Adaptation value is displayed, for example 0.

Notes:

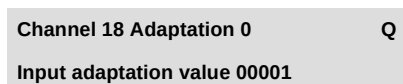
- ◆ Adaptation value "0" is input if auxiliary heater is not installed.
- ◆ Adaptation value "1" is input if an auxiliary heater is installed that is independent of engine condition (running or not).
- ◆ Adaptation value "10" is input if an auxiliary heater is installed that switches off when engine is not running.

- Press → button.



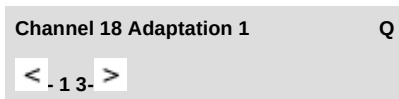
Indicated on display:

- Input adaptation value using keypad, filling initial positions with "0", for example 00001.



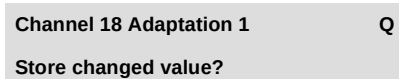
Indicated on display:

- Press -Q- button to confirm input.

01-154

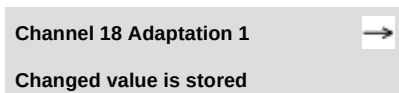
Indicated on display:

- Press -Q- button to confirm input.



Indicated on display:

- Press -Q- button to confirm input.



Indicated on display:

- End adaptation of the auxiliary heater by pressing the → button.

01-155

Adaptation of fuel gauge sender resistance range

This function is used to adjust the fuel gauge sender resistance range if the fuel gauge display in the instrument cluster does not match the actual amount of fuel in the tank.

Rapid data transfer **HELP**
Select function XX



Indicated on display

- Press -1- and -0- and confirm by pressing the -Q- button.

Rapid data transfer **Q**
10 - Adaptation



Indicated on display

- Press -Q- button to confirm input.

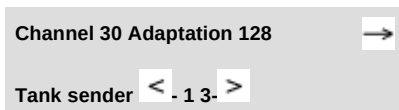
Adaptation
Input channel number XX



Indicated on display:

- Press buttons -3- and -0-.
- Press -Q- button to confirm input.

01-156

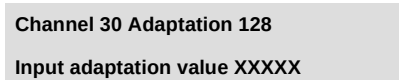


◀ Indicated on display: Adaptation value is displayed, for example 128.

Notes:

- ◆ "128" is the adaptation value for the standard resistance range for the fuel gauge sender as set by the factory.
- ◆ The resistance value for the fuel gauge sender resistance range can be adjusted by ± 8 Ohm to give an adaptation value between 120 and 136.
- ◆ If the value "128" was changed due to a customer complaint, the changed value must be transferred when replacing instrument cluster.

- Press → button.



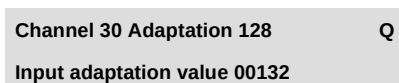
◀ Indicated on display:

- Input desired correction value using scan tool keypad, filling initial positions with "0" and watch how the display responds.

Example:

Desired input value: 132

Keypad input: 00132



◀ Indicated on display:

- Press -Q- button to confirm input.

01-157

Channel 30 Adaptation 132 Q

Tank sender < - 1 3- >



Indicated on display:

- Press -Q- button to confirm input.

Channel 30 Adaptation 132 Q

Store changed value?



Indicated on display:

- Press -Q- button to confirm input.

Channel 30 Adaptation 132 →

Changed value is stored



Indicated on display:

- End adaptation of the fuel gauge sender resistance range by pressing the → button.

01-158

Adaptation of the engine speed threshold

This function is used to adapt the offset value for the engine speed threshold to the dynamic oil pressure warning.

Rapid data transfer HELP
Select function XX



Indicated on display

- Press -1- and -0- and confirm by pressing the -Q- button.

Rapid data transfer Q
10 - Adaptation



Indicated on display

- Press -Q- button to confirm input.

Adaptation
Input channel number XX



Indicated on display:

- Press buttons -3- and 5-.
- Press -Q- button to confirm input.

01-159

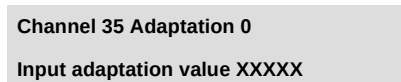


➤ Indicated on display: Adaptation value is displayed, for example 0.

Notes:

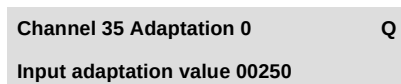
- ◆ *The adaptation value of 0 corresponds to the value set at the factory for the oil pressure warning if the oil pressure drops below 1.2 bar at 1500 rpm.*
- ◆ *The adaptation can be performed in four steps (0-1000).*
- ◆ *The adaptation value of "250" changes the engine speed threshold to 1750 rpm.*
- ◆ *If the value "0" was changed due to a customer complaint, the changed value must be transferred when replacing instrument cluster.*

- Press → button.



➤ Indicated on display:

- Input adaptation value using keypad, filling initial positions with "0", for example, 00250.



➤ Indicated on display:

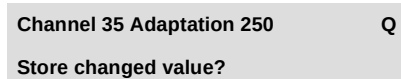
- Press -Q- button to confirm input.

01-160



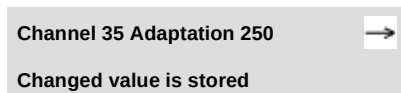
Indicated on display:

- Press -Q- button to confirm input.



Indicated on display:

- Press -Q- button to confirm input.



Indicated on display:

- End adaptation of the engine speed threshold by pressing the → button.

01-161

Distance driven since service

This function is used to input the distance in miles since the last service.

Rapid data transfer **HELP**
Select function XX



Indicated on display

- Press -1- and -0- and confirm by pressing the -Q- button.

Rapid data transfer **Q**
10 - Adaptation



Indicated on display

- Press -Q- button to confirm input.

Adaptation
Input channel number XX



Indicated on display:

- Press buttons -4- and -0-.
- Press -Q- button to confirm input.

Channel 40 Adaptation 8 
Actual value Insp. in 100 Miles  - 1 3- 



Indicated on display: The display indicates the number of miles driven since the last service (here for example, 8 indicates 800 miles)

Notes:

- ◆ *Input of current specified value is only possible in units of 100 miles, therefore indication in display also changes in 100 mile units.*
- ◆ *Observe notes when replacing instrument cluster ⇒ [Page 01-191](#) .*
- ◆ *Values can only be input directly using the scan tool keypad.*

01-84

Multi-function steering wheel, On Board Diagnostic (OBD)

General notes

Technical features of the multi-function steering wheel

The multi-function steering wheel enables the radio to be operated from the steering wheel (the most important functions) and contains an extensive On Board Diagnostic (OBD).

The control module for the multi-function steering wheel is equipped with a DTC memory. When malfunctions occur in monitored components or wiring, Diagnostic Trouble Codes (DTCs) are stored in DTC memory with a description of the malfunction type.

On Board Diagnostic (OBD), initiating program

Additional information

- ◆ Electrical Wiring Diagrams, Troubleshooting & Component Locations binder
- ◆ Technical service handbook.
- ◆ Parts catalog

Safety precautions

If special testing equipment is required during test drive, note the following:

WARNING!

- ♦ *To reduce the risk of accidents observe the following:*
- ♦ *During a road test in an airbag-equipped vehicle, the VAS5051 tester or the VAG1551 scan tool must always be fastened to and operated from the rear seat by a second technician.*

To reduce the risk of injury to people and or damage to the electrical system and components, observe the following:

- ◆ Always switch ignition off before connecting or disconnecting test/measurement tools.
- ◆ It is possible that the control module will recognize a malfunction and store a DTC during some tests. Therefore, after completing all tests and repairs, check and if necessary erase the DTC memory.
- ◆ Always switch ignition off before disconnecting or connecting the battery. Failure to do so may damage a control module.

Test requirements

- ◆ Check fuse for function according to wiring diagram.
- ◆ Connect VAS5051 tester or VAG1551 scan tool
⇒ [page 01-108](#) .
- ◆ Switch ignition on.

Notes:

- ◆ *If nothing is indicated on display, check voltage supply for VAG 1551 scan tool according to wiring diagram.*
- ◆ *Additional instructions can be called up via the HELP button on the scan tool.*
- ◆ *The → button is used for advancing through the program sequence.*
- ◆ *An incorrect entry can be canceled using the C button.*
- ◆ *Function 00 "Automatic test sequence" can be performed in operating mode 1 "Rapid data transfer". This automatically checks all control*

modules installed in the vehicle.

01-89

- Switch ignition on.
- Switch printer on via the PRINT button (indicator lamp in button lights up).
- Press button -1- to select "Rapid data transfer" operating mode 1.

Rapid data transfer HELP
Insert address word XX



Indicated on display

Address word for steering wheel electronics: 16

- Press buttons -1- and -6-.

Rapid data transfer Q
16 - Steering wheel electronics



Indicated on display

- Press -Q- button to confirm input.

01-90

4B0907487E Steering whl. electronics D00 →



Indicated on display after approx. 5 seconds:

- ◆ 4B0907487 E: Part number of steering wheel electronics - radio operation (see also parts catalog)
- ◆ Steering wheel electronics: component marking
- ◆ D00: Software version of control module
- Press → button.

Rapid data transfer HELP
Control module does not answer



If one of these messages is displayed, carry out trouble shooting procedures according to the wiring diagram.

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

Rapid data transfer HELP
Error in communication link

Rapid data transfer HELP
K wire not switching to Ground

Rapid data transfer HELP
K wire not switching to B+

Rapid data transfer

HELP

Select function XX



Indicated on display

- Pressing the HELP button will print out an overview of all of the possible functions.
- Press the → button to continue program sequence.

On Board Diagnostic (OBD) functions

The following functions are possible:

01 - Check Control Module Versions ⇒ [page 01-92](#) .

02 - Check DTC Memory ⇒ [page 01-93](#) .

03 - Output Diagnostic Test Mode ⇒ [page 01-97](#) .

05 - Erase DTC Memory ⇒ [page 01-100](#) .

06 - End Output ⇒ [page 01-102](#) .

08 - Read Measuring Value Block ⇒ [page 01-103](#) .

01-92

Check Control Module Versions (scan tool function 01)

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and 1-. This selects "Check control module" function 01.

Rapid data transfer Q
01 - Check Control Module Versions



Indicated on display

- Confirm input using the -Q- button.

4B0907487E steering whl. electronics D00 →



Indicated on display after approx. 5 seconds:

- ◆ 4B0907487 E: Part number of steering wheel electronics - radio operation (see also parts catalog)
- ◆ Steering wheel electronics: component marking
- ◆ D00: Software version of control module
- Press → button.

Check DTC Memory (scan tool function 02)

Note:

The displayed DTC information is updated only when initiating OBD or with "Erase DTC Memory" function 05.

- Switch printer on via the PRINT button (indicator lamp in button lights up).

Rapid data transfer HELP
Select function XX



Indicated on display

- Press buttons -0- and -2-. This selects "Check DTC memory", function 02.

Rapid data transfer Q
02 - Check DTC Memory



Indicated on display

- Confirm input using the -Q- button.

X DTC recognized

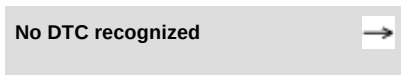


The number of stored malfunctions appears in the display.

The stored malfunctions are displayed and printed out one after the other.

- Check printout against DTC table and repair all malfunctions as necessary ⇒ [page 01-95](#) .

01-94



If "No DTC recognized" is displayed, the program will return to "Select function XX" after the → button is pressed.



Indicated on display

If something else is displayed:

⇒ *Scan Tool operating instructions*

- End output (Function 06) ⇒ [page 01-102](#)
- Switch off ignition and disconnect diagnostic connector.

Diagnostic Trouble Code (DTC) table

Notes:

- ◆ *The following list contains all malfunctions that can be recognized by the multi-function steering wheel and printed out by the VAG1551 scan tool. The malfunctions are listed in order according to their 5-digit numbers.*
- ◆ *DTC numbers appear only on the print-out.*
- ◆ *Before replacing a component shown as faulty, check the wiring and connections to the component as well as the Ground (GND) connections according to wiring diagram.*
- ◆ *After repairs and function test of the system, DTC memory must always be checked again using the VAG1551 scan tool and erased.*
- ◆ *DTC memory stores all static and sporadic malfunctions: If a malfunction occurs and persists for at least 2 seconds, it is identified as a static malfunction. If a malfunction does not occur again, it is registered as sporadic. "/SP" will appear at the right of the scan tool display.*
- ◆ *When the ignition is switched on, all existing malfunctions are automatically re-classified as sporadic malfunctions and will only register as static malfunctions if they still occur after testing.*
- ◆ *Sporadic malfunctions which no longer occur during 50 driving cycles (ignition on at least 5 minutes, vehicle speed 30 km/h) are erased automatically.*
- ◆ *The three digit malfunction type number appearing next to the DTC is a data code and can be ignored.*

01-96

DTC	Possible cause	Corrective action
VAG1551 scan tool display		
01426 Control unit in steering wheel -E221 ♦ No communication ♦ Implausible signal	♦ Open circuit in wiring - no connection between interface and steering wheel ♦ Unintelligible messages on CAN-bus (interface and buttons in steering wheel are connected via a CAN-bus)	- Locate malfunction using wiring diagram ⇒ <i>Electrical Wiring Diagrams, Troubleshooting & Component Locations</i> - Repair open circuit - Check wires between interface and steering wheel
65535 Control module malfunctioning ♦ Faulty	♦ Control module for multi-function steering wheel - J453- faulty	- Replace control module for multi-function steering wheel -J453-

01-97

Output Diagnostic Test Mode (DTM) (scan tool function 03)

Notes:

- ◆ Output Diagnostic Test Mode is only possible when vehicle is stationary and engine is not running!
- ◆ If malfunctions are found during output Diagnostic Test Mode, determine cause of malfunction and repair if necessary.

In the function " output Diagnostic Test Mode (DTM)" functions of the system are checked

Perform Output Diagnostic Test Mode

- Switch ignition on.
- Switch on radio.
- Press buttons -0- and -3-. This selects "output Diagnostic Test Mode (DTM)", function 3.



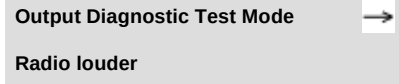
Indicated on display

- Press -Q- button to confirm input.

Rapid data transfer

Q

03 - Output Diagnostic Test Mode



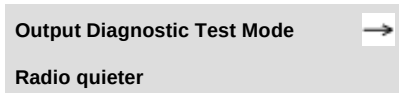
- Press the → button.



Indicated on display

The radio volume is increased audibly.

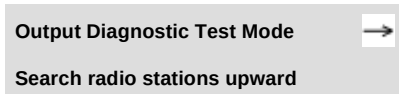
- Press the → button.



Indicated on display

The radio volume is decreased audibly.

- Press the → button.

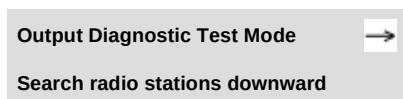


Indicated on display

The next station will be searched and displayed in combination center display.

- Press the → button.

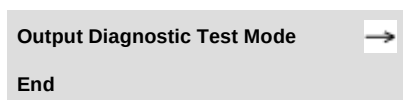
01-99



Indicated on display

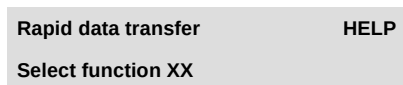
The previous station will be adjusted again and will be displayed in combination center display.

- Press the → button.



Indicated on display

- Press the → button.
- The tester returns to the "Select function" mode.



Indicated on display

Erase DTC Memory (scan tool function 05)

Note:

If DTC memory cannot be erased, check DTC memory again and repair malfunction.

Requirements

- ◆ DTC memory checked ⇒ [page 01-93](#)
- ◆ All malfunctions repaired

After successful DTC memory check:



Indicated on display

- Press buttons -0- and -5-. This selects "Erase DTC memory", function 05.

Rapid data transfer
Select function XX

HELP

01-101

Rapid data transfer Q
05 Erase DTC Memory

- ⏮ Indicated on display
- Confirm input using the -Q- button.

Rapid data transfer →
DTC Memory is erased!

- ⏮ Indicated on display
- DTC memory is erased.
- Press the → button.

Rapid data transfer HELP
Select function XX

- ⏮ Indicated on display

Notes:

Attention! →
DTC Memory was not interrogated

- ⏮ ♦ *This message indicates an error in the test sequence.*

Rapid data transfer →
DTC Memory was not interrogated

- ⏮ ♦ *This message indicates an error in the test sequence.*

Follow test sequence exactly: first check DTC memory, repair malfunction (s) if necessary, then erase.

01-102

End Output (scan tool function 06)

- Press buttons -0- and -6-. This selects "End Output", function 06.

Rapid data transfer Q
06 - End output



Indicated on display

- Confirm input using the -Q- button.

Rapid data transfer HELP
Insert address word XX



Indicated on display

- Switch ignition off.
- Disconnect harness connectors for the VAG1551 scan tool

Read Measuring Value Block (scan tool function 08)

Initiating "Read Measuring Value Block"

Rapid data transfer HELP
Select function XX

➤ Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08.

Rapid data transfer Q
08 - Read Measuring Value Block

➤ Indicated on display

- Confirm input using the -Q- button.

Read Measuring Value Block
Input display group number XXX

➤ Indicated on display

- Input display group number (from table ⇒ [page 01-104](#)) and press -Q- button to confirm input.

The selected measuring value block is now displayed in standard form.

01-104

Display group overview

Display group number	Indicated on display
001	1 = Lower button 2 = Louder button 3 = Memory downward button 4 = Memory upward button
002	1 = Station buttons (preset) backward 2 = Station buttons (preset) forward 3 = Unassigned 4 = Unassigned

01-105

Measuring value block 001

Read Measuring Value Block 1



◀ Indicated on display:

lower

louder

Memory backward

Memory upward

Memory upward button

- not operated
- Memory upward

Memory downward button

- not operated
- Memory downward

Louder-button (increasing volume)

- not operated
- louder

Lower button (decreasing volume)

- not operated
- lower

01-106

Measuring value block 002

Read Measuring Value Block 2 → ◀ Indicated on display:

activated

activated



Station buttons (preset) forward

- not operated
- operated

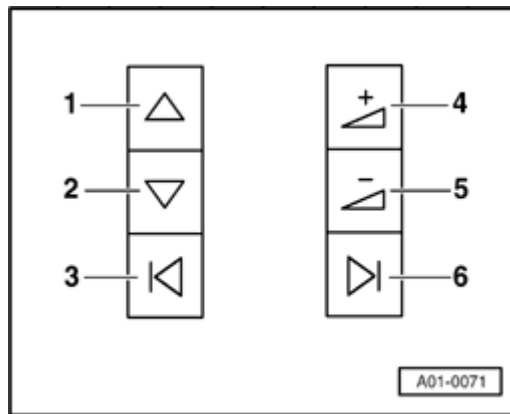
Station buttons (preset) backward

- not operated
- operated

01-107

Multi-function steering wheel button assignment

Radio button assignment



1 - Radio: Forward search function; Cassette: Fast forward; CD: Title forward

2 - Radio: Backward search function; Cassette: Rewind; CD: Title backward

3 - Station buttons (preset) backward

4 - Increase volume

5 - Decrease volume

6 - Station buttons (preset) forward

01-203

Cruise control On Board Diagnostic (OBD)

Special tools, test equipment and auxiliary items

- ◆ VAS5051 Diagnostic Operation Center (DOC) and/or VAG1551 Scan Tool (ST).
- ◆ VAG1551/3 adapter cable

Gasoline engines with electronically-operated throttle valve only

Testing cruise control system

- Connect VAG1551 scan tool (⇒ [Page 01-241](#)) and use "Address word 01" to select engine control module.

The engine should be idling.

Except for the control lever, there are no system components for the cruise control system. All functions are carried out by the engine control module.

Initiating "Read Measuring Value Block" scan tool function 08



Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08.

Rapid data transfer

HELP

Select function XX

01-205

Rapid data transfer **Q**
08 - Read Measuring Value Block



Indicated on display

- Press -Q- button to confirm input.

Read Measuring Value Block **HELP**
Input display group number XXX



Indicated on display

- Enter display group number 066.
The engine should be idling.
- Press -Q- button to confirm input.

The measured value block which has been selected will appear in the standard format.

Display group overview

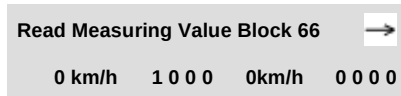
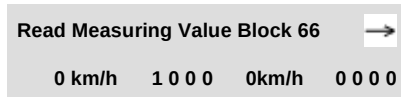
Display group number	Display fields	
066	1 =	Actual vehicle speed km/h
	2 =	Switch positions of brake, clutch and cruise control (open or closed)
	3 =	Desired vehicle speed km/h
	4 =	Control lever switch positions

01-206

Display group 066

Read Measuring Value Block 66			→	◀ Indicated on display
km/h	X X X X	km/h	X X X X	
				Control lever switch positions 0 0 0 0 = Cruise control off (switch engaged) 0 0 1 1 = Cruise control on 0 0 0 1 = Cruise control off before engagement position 0 1 1 1 = Fix button pushed 1 0 1 1 = Record button pulled
				Desired vehicle speed (speed last saved is displayed until): ♦ Cruise control is switched off at control lever, i.e. switch is engaged on "OFF" or ♦ Engine is stopped.
				Switch positions for brakes, clutch and cruise control released. 1 0 0 0 = Cruise control released 1 0 1 1 = Brake applied (brake pedal switch) 1 1 0 0 = Clutch applied
	Actual vehicle speed			

01-207



⏮ Indicated on display

Checking displays in display fields 2 and 4

⏮ Display check, display field 2

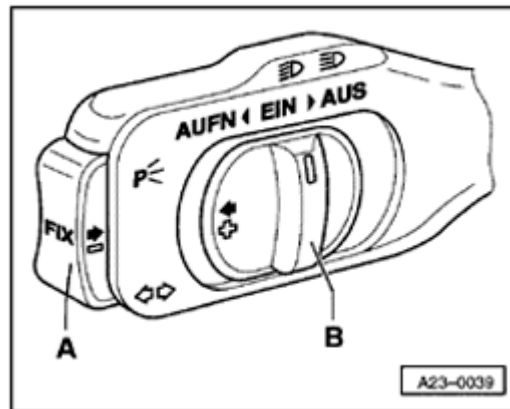
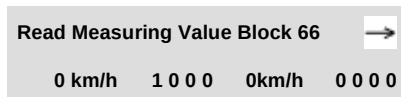
Test conditions	Display field 2
Cruise control released (activated)	1000
Brake applied (brake pedal switch)	1011
Clutch applied	1100

If the nominal value in display field 2 for "cruise control released" (1000) is not attained:

- Check engine control module identification.

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 01*

- If "G" is not displayed after component name, cruise control is not activated. Activate cruise control system ⇒ [Page 01-209](#) .



Display check, display field 4

Test conditions	Display field 4
Switch -B- in "OFF" (AUS) position	0000
Switch -B- to "ON" (EIN) position	0011
Memory set, switch -B- to "OFF" (AUS) before engaging	0001
Button -A- pressed, "SET" (FIX)	0111
Switch -B- to "RES" (AUFN)	1011

If the nominal values in display field 4 are not attained even though switch -B- is set to "ON" (0011):

- Connect VAG1598/31 breakout box to engine control module harness
⇒ [Page 01-210](#) .

01-209

Activating cruise control

- Connect VAG1551 scan tool (VAG1552) ⇒ [Page 01-241](#) .
- Insert "Address word 01" to select engine control module.



Indicated on display

- Press button -1- twice for "Login procedure" function 11 and press -Q- button to confirm input.



Indicated on display

- Input code 11463 and press -Q- button to confirm input.

Deactivate cruise control

- Connect VAG1551 scan tool (VAG1552) ⇒ [Page 01-241](#) .
- Use "Address word 01" to select engine control module.



Indicated on display

- Press button -1- twice for "Login procedure" function and press -Q- button to confirm input.



Indicated on display

Rapid data transfer HELP
Select function XX

Login procedure HELP
Input code number XXXXX

Rapid data transfer HELP
Select function XX

Login procedure HELP
Input code number XXXXX

- Input code 16167 and press -Q- button to confirm input.

Testing wiring and components using VAG1598/31 breakout box

Notes:

- ◆ *VAG1598/31 breakout box is designed to be connected to the engine control module harness and to the engine control module simultaneously.*
- ◆ *The effect of this design is that the electronic engine controls remain fully functional while the breakout box is connected (for e.g. measuring signal strengths while the engine is running).*
- ◆ *Look in the respective test descriptions to see if it is necessary to connect the engine control module to the breakout box.*
- ◆ *Use multimeter (Fluke 83 or equivalent) or VAG1715 Multimeter in addition to VAG1527B voltage tester.*
- ◆ *Always use test leads from VW1594 connector test kit when connecting test equipment to VAG1598/31 breakout box.*
- ◆ *Once the engine control module has been reconnected, adapt the engine control module*

to the throttle valve control module.

⇒ *Repair Manual, Fuel Injection & Ignition,
Repair Group 24*

CAUTION!

***Before connecting the test leads, switch the
test equipment to the appropriate measuring
range and observe the test requirements to
prevent damage to electronic components.***

01-211

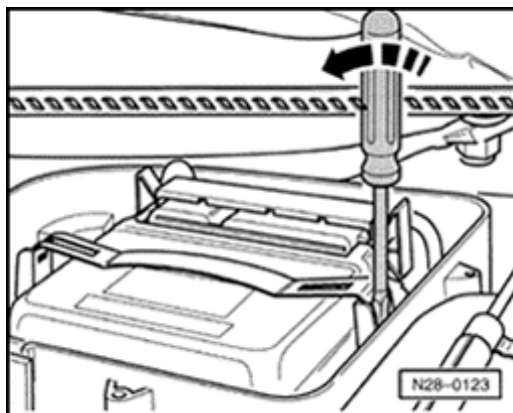
- Switch ignition off.

- Remove control module protective housing cover.

A

- Using screwdriver, carefully pry off retainer (arrow).

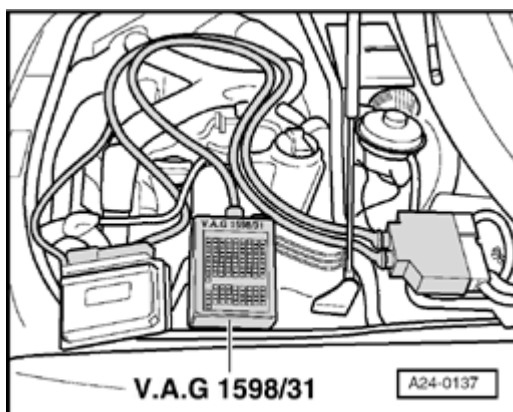
- Release and disconnect harness connectors from control module.



A

- Connect VAG1598/31 breakout box to harness connector. Connect breakout box Ground clip (not visible in illustration) to battery negative terminal. Check respective test descriptions to see if it is necessary to connect engine control module to breakout box.

- Perform tests as described in respective repair instructions.



01-212

- Disconnect 15-pin harness connector for cruise control switch, clutch vacuum vent valve switch - F36- and to brake vacuum vent valve switch - F47- for cruise control.
- Check the following connections for a short to positive, short to Ground (GND) or an open circuit:

Gasoline engine: 2.7 liter/184 kW V6 twin-turbo

Terminals on 15-pin harness connector	VAG1598/31 breakout box, socket
7	76
8	75
9	57
10	38

- If necessary, repair open or short circuit.

01-213

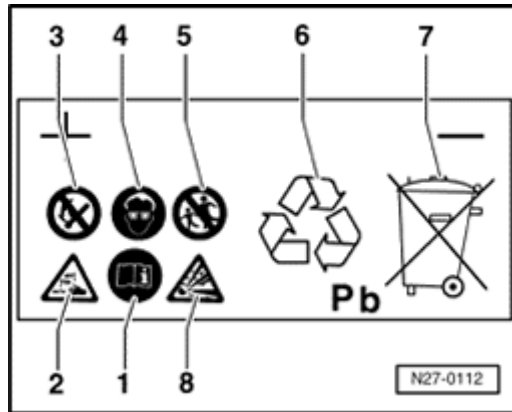
Terminals on 15-pin harness connector	VAG1598/31 breakout box, socket
13 to clutch vacuum vent valve switch -F36- (terminal 1)	39
11 to brake vacuum vent valve switch -F47- for cruise control (terminal 2)	56
12 to brake vacuum vent valve switch -F47- for cruise control (terminal 4)	55

- If necessary, repair open or short circuit.

Battery

The battery is one of the most important electrical components in the vehicle. If it functions properly, the battery will make a significant contribution to customer satisfaction. To ensure a long service life, the battery must be checked, serviced and maintained as described in this section.

In addition to starting the engine, the battery has additional functions as a buffer and supplier of electrical power for the entire vehicle electrical system.



Warnings and safety precautions for lead-acid batteries

1 - Follow the recommendations on the battery, in this Repair Manual and in the Owners Manual.

2 - Danger of acid burns:

Battery acid is extremely caustic, therefore wear protective gloves and eye protection.

Do not tip battery. Acid may escape from battery vents.

3 - Keep open flame, sparks, unenclosed light bulbs and lit smoking materials away from battery.

Guard against creating sparks when working with cables and electrical equipment.

- Avoid short-circuits.

4 - Wear eye protection

5 - Keep children away from acid and batteries.

6 - Proper disposal:

Waste batteries must be brought to appropriate waste disposal site. Dispose of old batteries in compliance with applicable Federal, State and local laws regarding hazardous waste disposal.

7 - Never discard old batteries in the household trash!

8 - Explosive hazard:

Highly explosive gas is produced when batteries are charged.

Battery handling instructions

Notes:

- ◆ *Battery terminals should no longer be coated with grease.*
- ◆ *To avoid damage to the battery case, place the cable clamps on the terminals by hand without using force.*
- ◆ *The battery terminal clamp tightening torque is 6 Nm (53 in. lb).*
- ◆ *Once the battery is reconnected, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as described in the Repair Manual or the Owner's Manual.*

Battery, removing and installing

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

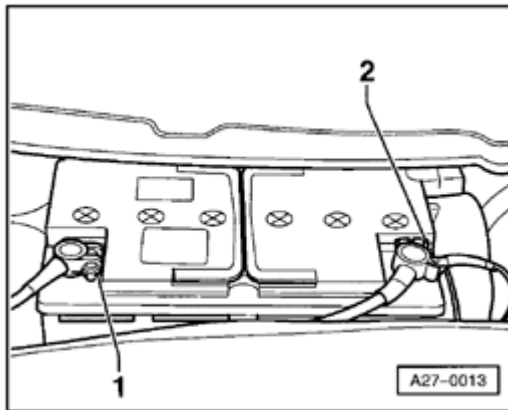
Notes:

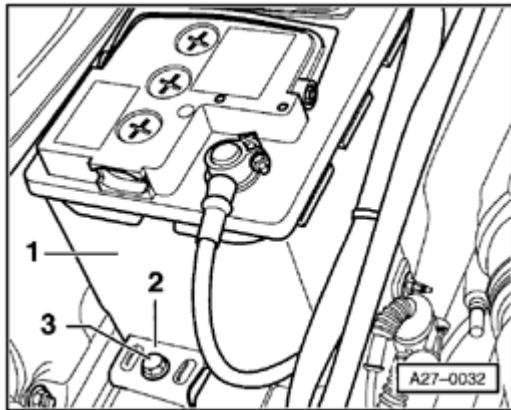
- ◆ Before disconnecting the battery, determine the correct coding for the anti-theft radio.
- ◆ Once the battery is reconnected, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as described in the Repair Manual or the Owner's Manual.

Removing

4

- Disconnect battery Ground (GND) strap from negative terminal by loosening nut -1-.
- Tightening torque: 6 Nm (53 in. lb)
- Disconnect battery positive cable from positive terminal by loosening nut -2-.
- Tightening torque: 6 Nm (53 in. lb)





A

- Remove bolt -3- and remove hold-down clamp -2-.
- Tightening torque: 15 Nm (11 ft lb)
- Lift battery -1- out of battery tray.

Installing

Notes:

- ◆ *The newest generation of batteries is equipped with a central gas vent and flame trap by means of a "baffle."*
- ◆ *Function: the gas produced during charging escapes at one place through an opening in the top of the cover. The flame trap (which prevents the flammable gas located in the battery from igniting) is also integrated in this unit.*
- ◆ *For proper venting of the battery via the diffuser and the hose, it is important that the hose attached to the central gas vent does not become pinched off during installation.*
- ◆ *The diffuser consists of a small round glass fiber mat having a diameter of approximately 15 mm and a thickness of 2 mm. It functions similar to a valve, i.e., it allows the gas formed in the battery to flow out.*

Note:

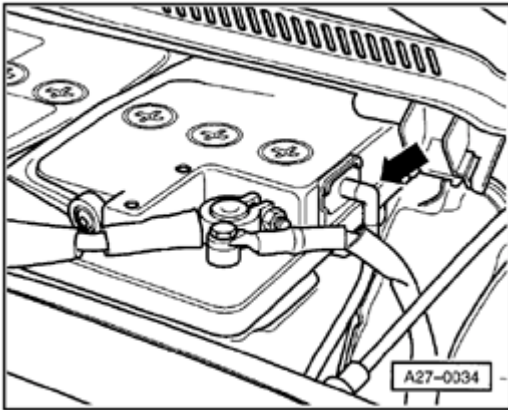
When installing the battery (if the battery has a central gas vent), make absolutely certain that the hose is not pinched off. This allows the battery be freely vented via the diffuser and the hose. If the battery does not have a hose, make sure that the opening on the top of the battery's cover is not plugged.

- Install in reverse order of removal.

Make sure battery is securely mounted

If the battery is not secured properly, there is a risk that the following might occur:

- ◆ Shortened service life due to damage caused by vibration
- ◆ Battery cell and plate damage
- ◆ Damage to battery case by the hold-down clamp (possible release of electrolyte resulting in costly damage).
- ◆ Poor collision safety



Visual inspection

WARNING!

When charging, measuring the voltage or load testing a battery, the cell caps must always be screwed in tightly.

Before performing tests such as no-load voltage, specific gravity or the battery load tests, a visual check should be made of the battery.

The purpose of this check is to determine

- ◆ If the case of the battery has been damaged. Damage to the case can cause acid to leak.
- ◆ If the terminals have been damaged. Damaged terminals make it impossible to assure a good contact at the terminal. This can lead to a cable fire and damage to the electrical system.

Electrolyte level, checking

CAUTION!

To ensure that the various battery cover systems do not leak, the original cell caps that come with the battery must always be screwed in. If they are lost or damaged, use only genuine cell caps for the same model battery. The cell caps must be equipped with an O-ring seal.

Notes:

- ◆ *Maintaining the correct electrolyte level is important for long battery life.*
- ◆ *If the battery has visible minimum and maximum lines on the case, the electrolyte level can be checked from outside the battery.*
- ◆ *The electrolyte level must be between the minimum and maximum lines.*
- ◆ *If the external minimum and maximum lines are hard to see or if it is difficult to see the electrolyte level due to opacity of the battery case, the cell caps will have to be removed. After that it will be possible to visually check the electrolyte level from the interior of the battery.*

- ◆ *The electrolyte level must reach the internal electrolyte level indicator (lip of plastic flange). This corresponds to the external maximum line on the battery case.*

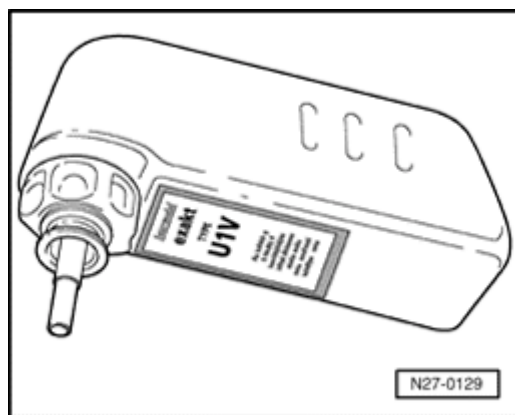
Electrolyte level too low

Special tools, test equipment and auxiliary items

VAS5045 battery cell filler

Note:

If the electrolyte level is too low, the plates will dry out causing a loss of capacity (power loss) in the battery. If the plates are not surrounded by electrolyte (sulfuric acid), the plates, plate straps and the cell connectors will corrode. The result of this corrosion is that battery function can no longer be assured. The battery is made useless.



A

- If electrolyte level is too low, add distilled water up to maximum mark using VAS5045 battery cell filler.

Notes:

- ◆ The design of the filler nozzle of the VAS5045 battery cell filler prevents overfilling the battery cell and loss of battery acid. When the maximum fill level is reached, the flow of distilled water into the battery cell is stopped.
- ◆ To avoid contaminating the electrolyte, add only distilled water to the battery (contaminated water will lead to increased self-discharge).

27-10

Electrolyte level too high

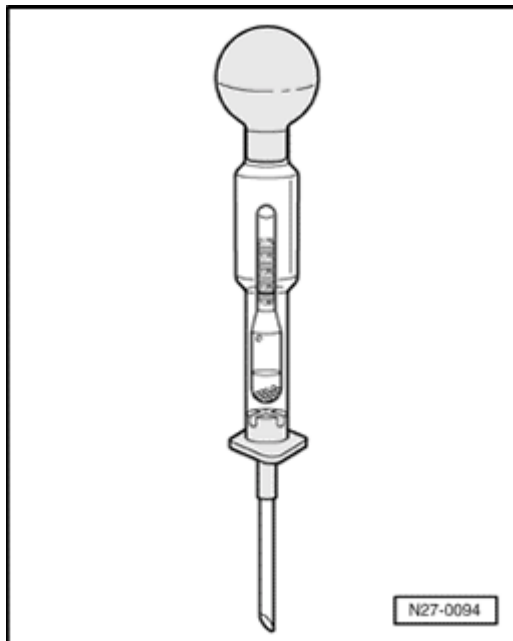
Special tools, test equipment and auxiliary items

- ◀ Commercially available hydrometer

Note:

If the electrolyte level is too high, the sulfuric acid/water mixture will leak to the outside of the battery and damage functional components in the engine compartment.

- If electrolyte level is too high (overfilling), i.e., it is above internal electrolyte level mark (lip of plastic flange) or external maximum line, draw off excess electrolyte using commercially available hydrometer.
- Draw off electrolyte using hydrometer until electrolyte level has reached lip of plastic flange or maximum line.



Batteries with central gas vent

CAUTION!

- ♦ *Make absolutely certain that only batteries of the most recent design with central gas vents are installed.*
- ♦ *Always use the original cell caps. The caps must be equipped with an O-ring seal.*

There are two types of batteries with central gas vents:

- ♦ Batteries with a hose on the central gas vent
- ♦ Batteries without a hose on the central gas vent

No-load voltage, checking

CAUTION!

- ◆ *Battery cell caps must be screwed in tightly when charging, measuring voltage or performing load tests.*
- ◆ *Always comply with the following instructions otherwise a correct measurement cannot be assured.*

Special tools, test equipment and auxiliary items

- ◆ VAG1715 multimeter or
- ◆ VAG1362 minitester or
- ◆ Multimeter (Fluke 83 or equivalent)

Notes:

- ◆ *When testing the no-load voltage of a battery installed in a vehicle, make sure the battery Ground (GND) strap is disconnected.*
- ◆
The battery must not have been under a load

for at least two hours before the test.

- ◆ *The battery must not have been charged at least two hours before the test.*

Use the following procedure for testing the voltage of a battery which is not under load:

- Switch ignition off.
- Disconnect battery Ground strap.
- Measure voltage between battery terminals.
 - ◆ 12.5 volts or higher: battery OK
 - ◆ Below 12.5 volts: recharge battery immediately ⇒ [Page 27-21](#)

Specific gravity, checking

Special tools, test equipment and auxiliary items

- ◆ Commercially available hydrometer
- ◆ Shop towel

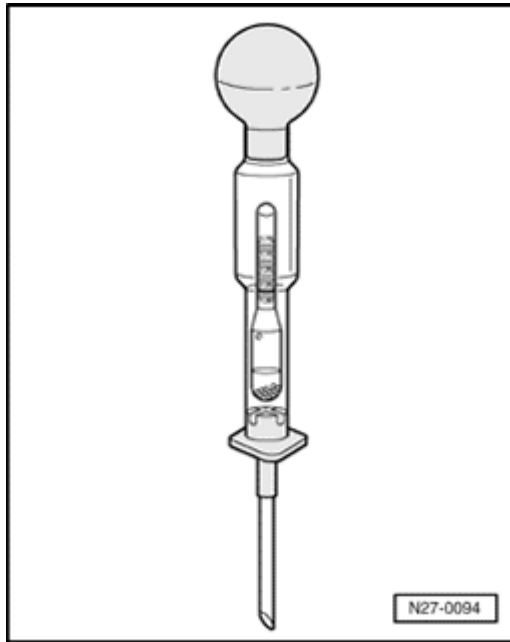
CAUTION!

- ◆ *When working with battery acid, make sure to follow all "Warnings and safety precautions for lead-acid batteries." Wear suitable protective clothing and eye protection.*
- ◆ *When disposing of batteries, always comply with applicable Federal, State and local laws regarding the disposal of batteries and sulfuric acid.*

Notes:

- ◆ *In order to better determine the overall condition of a battery, always perform a specific gravity test in conjunction with the load test.*
- ◆ *The temperature of the electrolyte must be at least 10° C (50° F).*

The specific gravity can be tested immediately after charging the battery.



27-15

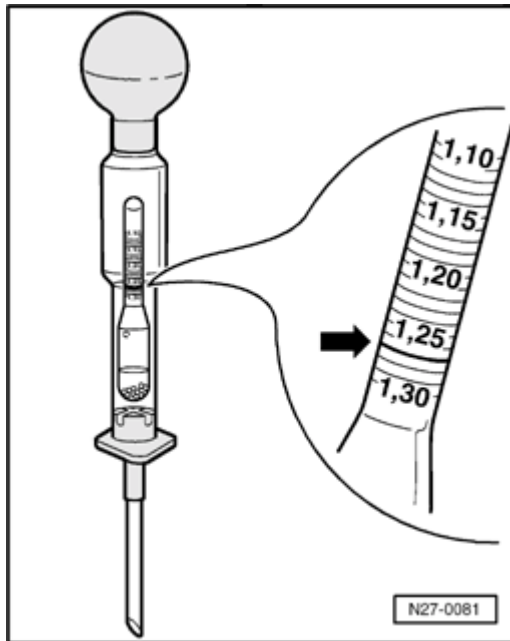
Use the following procedure to test the specific gravity in all of the battery cells:

- Switch ignition off.
- Remove all cell caps.
- Immerse tip of hydrometer into battery cell and draw out enough electrolyte to allow indicator to float freely.

The higher the specific gravity of the drawn electrolyte, the higher the indicator will float.

The specific gravity of the electrolyte can be read in kg/dm³ on the hydrometer scale.

- Compare measured value indicated on hydrometer to values indicated in table below:



State of charge in normal climate zones	Specific gravity in kg/dm ³
Discharged	1.12
Half charged	1.20
Good charge	1.28

In normal climate zones, the specific gravity must be at least 1.24 kg/dm³.

- If specific gravity is too low: charge battery.
- After charging battery, repeat specific gravity test.

Note:

The measured values for the specific gravity of the individual battery cells must not vary by more than 0.03 kg/dm³.

Examples of unacceptable variations in specific gravity:

Battery cell:	1	2	3	4	5	6
	Specific gravity per cell in kg/dm ³					
Example 1:	1.24	1.25	1.25	1.10	1.24	1.25
Example 2:	1.26	1.26	1.25	1.14	1.18	1.24

Example 1:

The specific gravity in cell 4 is too low.

Example 2:

The specific gravity in cells 4 and 5 is too low (the difference in specific gravity between the cells is greater than 0.03 kg/dm³).

- If values are not met, replace battery.
- If values are met, reinstall cell caps.

The original cell caps that came with the battery must be reinstalled to help prevent leakage.

If the cell caps are lost or damaged, use replacement cell caps of the same manufacture.

The cell caps must be equipped with an O-ring seal.

Load testing

In order to better determine the overall condition of a battery, always perform a load test in conjunction with the specific gravity test.

Special tools, test equipment and auxiliary items

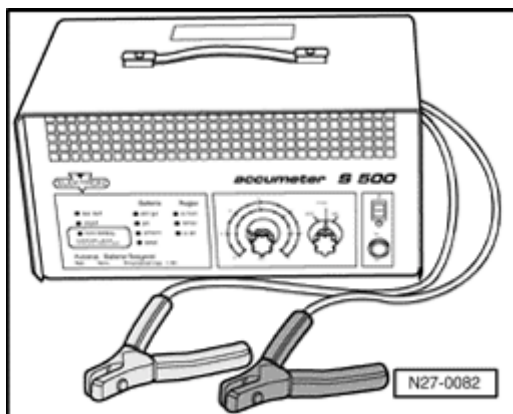


- ◆ VAS1979 or VAS5033 battery tester

Note:

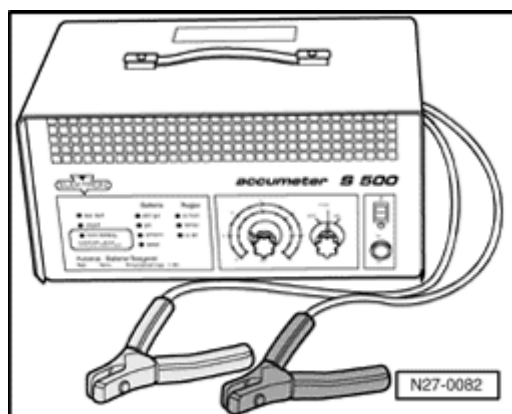
When using the VAS1979 or VAS5033 battery tester, it is not necessary to remove the battery or disconnect the battery cables.

- Follow warnings and safety precautions for lead-acid batteries. Wear protective clothing such as face shield and leather gloves.



Load test procedure

- Switch ignition off.
- Read battery tester operating instructions.



- Observe carefully:
Connect the clamps to the battery terminals as required by the tester instruction manual. The clamps must make good contact with the battery terminals.
- Load current varies depending on battery capacity, set load current on tester appropriately.

⇒ *Battery tester operating instructions*

- Obtain load current from table below.
 - ◆ The minimum voltage (the voltage which must be exceeded) varies and can be obtained from the table below.
 - ◆ The load current and minimum voltage vary depending on the capacity of the battery.

Table

Battery capacity	Cold cranking amps	Load current	Minimum voltage (limit)
70 Ah	340 A	200 A	9.5 V

Load test results

- ◆ The severe load (ohmic resistance) during this test (high current draw) causes the battery voltage to drop. If the battery is in good condition, the voltage value will only drop to the minimum voltage. The minimum voltage varies and depends on battery capacity and cold cranking amps. Cold cranking amps is understood to be the capacity of the battery in cold weather. Batteries with high cold cranking amps are especially important in vehicles with high compression engines.
- ◆ If the battery is faulty or has only a weak charge, the battery voltage will drop off very quickly "voltage collapse" (voltage below 9.0 V). After the test is completed, this low voltage will last for a longer period of time and the voltage will increase only very slowly. Such a battery will no longer reach a usable voltage (no-load voltage) ⇒ [Page 27-12](#) .
- ◆ A battery with the faults described above does not have the power reserve of an undamaged battery and must be discarded.

Battery, charging

CAUTION!

- ◆ *Battery cell caps must be screwed in tightly when charging, measuring voltage or performing load tests.*
- ◆ *Do not enter the room in which batteries are being charged with unenclosed light bulbs or when smoking. The reason for this is that an explosive gas is formed in the battery by the charging process.*

Special tools, test equipment and auxiliary items

- ◆ Battery charger
- ◆ Batteries should be charged using a VAG battery charger such as VAG1471, VAG1648 or VAS1974.

Notes:

- ◆ *The temperature of the battery must not be less than 10° C (50° F).*
- ◆ *Batteries should not be fast-charged; fast-*

charging damages batteries.

- ◆ *If totally discharged batteries are fast-charged, either they will not accept any charging current or they will appear to be fully charged too early due to a "surface charge" and will only appear to be OK.*

Battery charging procedure

- Switch off battery charger.
- Switch ignition off.
- First disconnect battery Ground (GND) strap; then disconnect positive cable from battery.
- Connect positive cable of battery charger to positive terminal of battery.
- Connect negative cable of battery charger to negative terminal of battery.
- Adjust charging current on battery charger to battery capacity. It should be equivalent to approximately 10% of battery capacity or about 6 A for 60 Ah battery.
- Switch on battery charger.

Charging totally discharged batteries

Batteries out of operation for extended periods of time, such as in stored vehicles, lose their charge.

A battery is totally discharge if its no-load voltage has dropped to less than 11.6 V. To measure no-load voltage ⇒ [Page 27-12](#)

In totally discharged batteries, the electrolyte (sulfuric acid/water mixture) consists almost entirely of water, since the sulfuric acid component has been strongly reduced. At freezing temperatures, the battery can freeze and the case may burst.

Totally discharged batteries sulfate, i.e., the plate surfaces of the batteries harden and the electrolyte is not clear and has a slightly whitish coloration.

If totally discharged batteries are charged again immediately after the deep discharge, the sulfating forms again.

If these batteries are not recharged, the plates harden further and the charging capacity is diminished resulting is a loss of battery power.

Procedure for charging totally discharged, sulfated batteries

Totally discharged, sulfated batteries must be charged with a low charging current as follows:

- Set charging current to approximately 5% of battery capacity, (e.g., for 60 Ah battery, charging current should be about 3 amps).

To charge the battery ⇒ [Page 27-22](#) . The charging voltage must not exceed 14.4 volts.

Never fast-charge totally discharged batteries.

Note:

Once the battery is reconnected, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as described in this Repair Manual or the Owners Manual.

Fast-charging/boost starting

Notes:

- ◆ *Batteries should be fast-charged (charging current approximately 20% of battery capacity and higher) only under exceptional circumstances.*
- ◆ *Batteries are damaged by fast-charging.*
- ◆ *Boost starting is also possible using the VAG1472 starter/charger.*
- ◆ *The VAS1992 battery-starter provides boost starting for vehicles with totally discharged/weak batteries without connection to line voltage. Depending on the outside temperature and battery capacity, 15-30 starting operations can be completed.*

Generator, removing and installing

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *Once the battery is reconnected, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as described in this Repair Manual or the Owners Manual.*

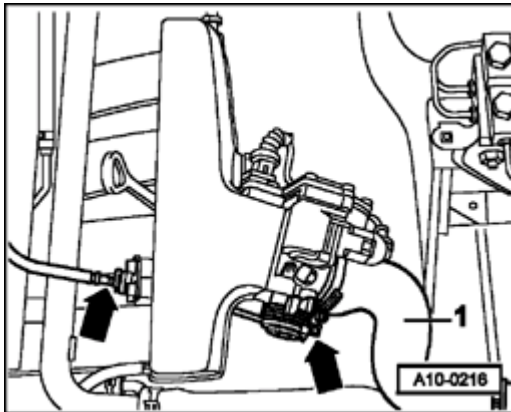
Vehicles with 4-cylinder gasoline engines

Removing

1.8 Liter/110 kW, 5V Turbo

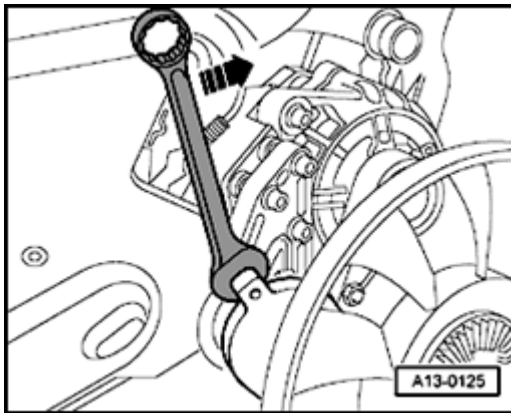
A

- Disconnect air duct -1- for charge air cooler from throttle valve.

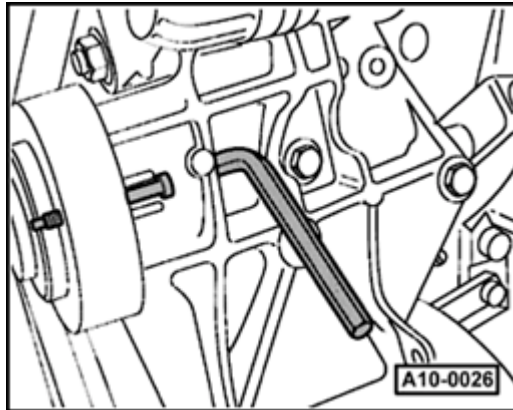


A

- Pivot ribbed belt tensioner in direction of arrow and remove ribbed belt from generator pulley.
- Slowly release pressure on tensioner.

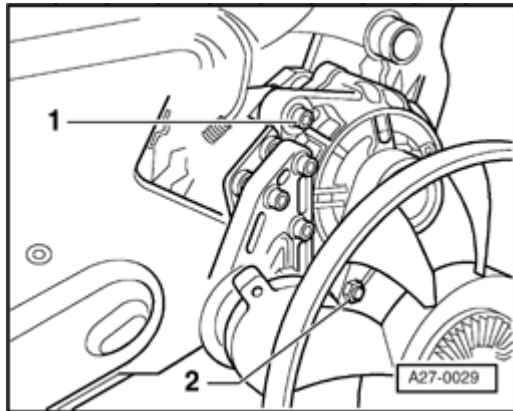


27-28



A

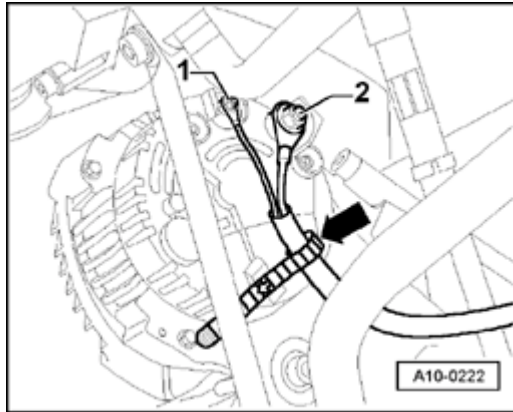
- Secure viscous clutch with 5 x 60 mm bolt and remove mounting bolt for viscous clutch.
- Tightening torque: 45 Nm (33 ft lb)
- Remove viscous clutch.



A

- Remove socket-head bolt -1-.
- Tightening torque: 25 Nm (18 ft lb)
- Remove nut -2- from bolt.
- Tightening torque: 45 Nm (33 ft lb)
- Pivot generator slightly to side and remove bolt from below.

27-29



A

- Release wiring harness from cable tie (arrow).
- Disconnect wire on terminal 30/B+ by removing nut -2-.
- Tightening torque: 16 Nm (12 ft lb)
- Disconnect wire on terminal D+ by removing nut -1-.
- Tightening torque: 4 Nm (35 in. lb)
- Carefully push radiator hose to side and lift generator up and out.

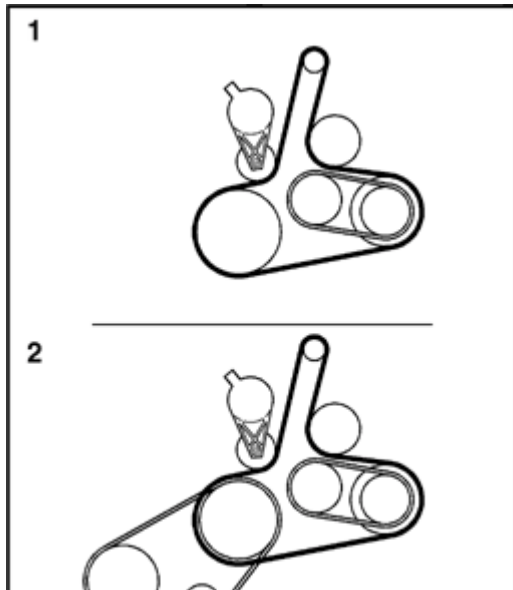
Installing

- To make it easier to install generator onto mount, drive bushing for mounting bolt back approx. 1 mm.
- Install generator in reverse order of removal.

A

- Make sure ribbed belt is properly seated and correctly routed.

- 1 - Without air conditioning
- 2 - With air conditioning

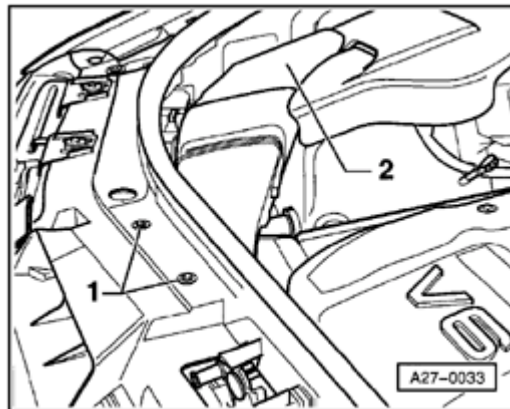
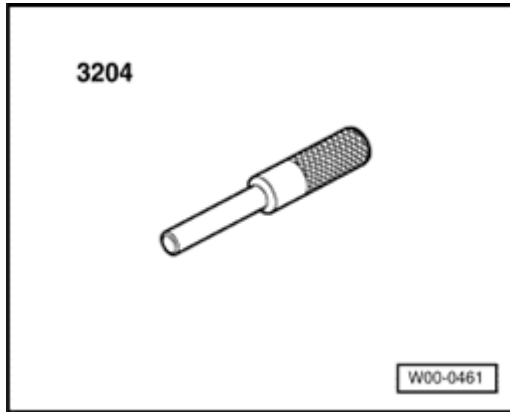


Vehicles with 6-cylinder gasoline engines

Special tools, test equipment and auxiliary items

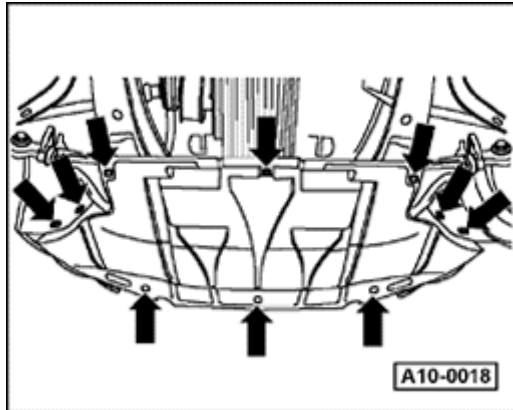
➤ 3204 drift

Removing



➤ - Remove two bolts -1- on air intake duct and then lift up back portion of air intake duct -2-.

27-31



A

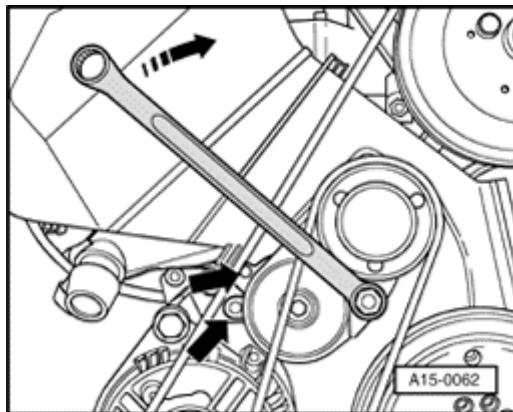
- Remove noise insulation panel (arrows).
- Remove front bumper.

⇒ [Repair Manual, Body Exterior, Repair Group 63](#)

- Move lock carrier to service position.

⇒ [Repair Manual, Body Exterior, Repair Group 50](#)

- Remove cover for engine and ribbed belt.



A

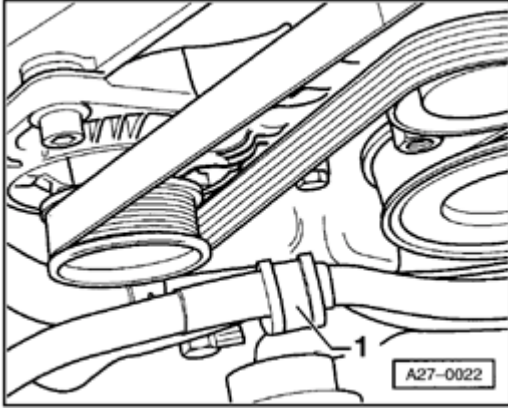
- Rotate tensioner for ribbed belt toward right using box wrench until both holes are in alignment (lower arrows), and secure in place using 3204 drift.
- Remove ribbed belt from generator pulley.

Vehicles with air conditioning

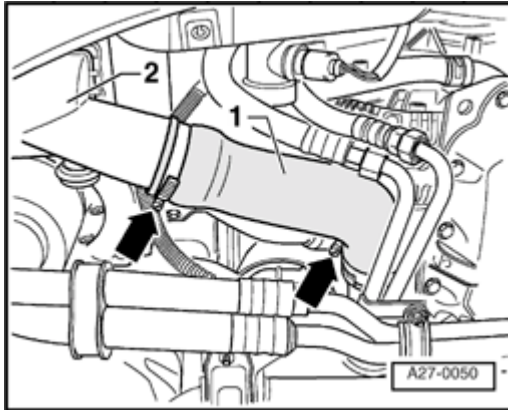
(Except 2.7 Liter/184 kW engine, 5V twin-turbo)

A

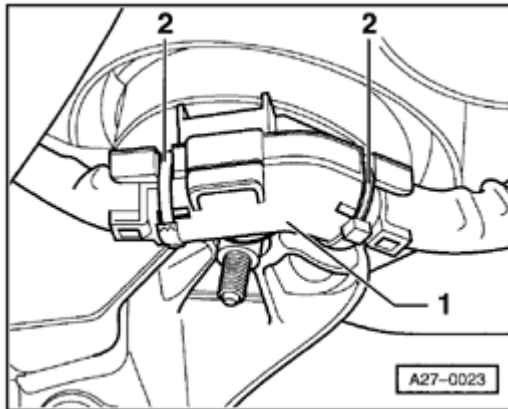
- Remove mounting clamp -1- for refrigerant lines above torque arm.



27-33

2.7 Liter/184 kW engine, 5V Twin-turbo only**A**

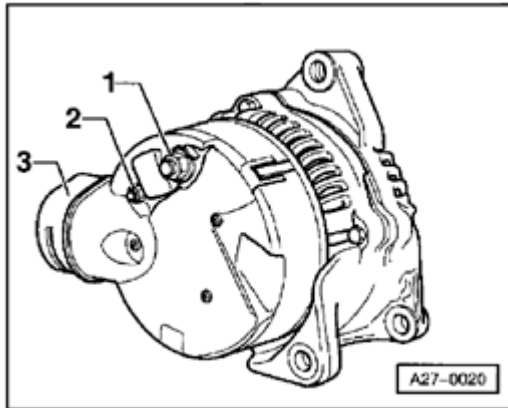
- Remove air duct -1- (arrow).
- Remove charge air cooler on right -2- (loosen hose connection above, mounted on three rubber supports).

All vehicles**A**

- Detach cable for starter and generator from bracket -1-.

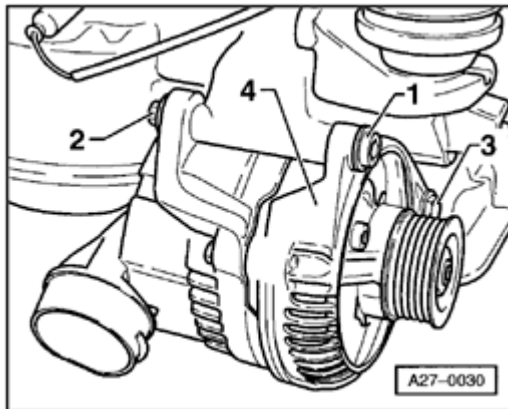
To do this, cut both tie wraps -2- open and then release the snap catches.

27-34



A

- Disconnect air duct from generator fitting -3-.
- Disconnect wire on terminal 30/B + by removing nut -2-.
Tightening torque: 16 Nm (12 ft lb)
- Disconnect wire on terminal D+ by removing nut -1-.
Tightening torque: 4 Nm (35 in. lb)



A

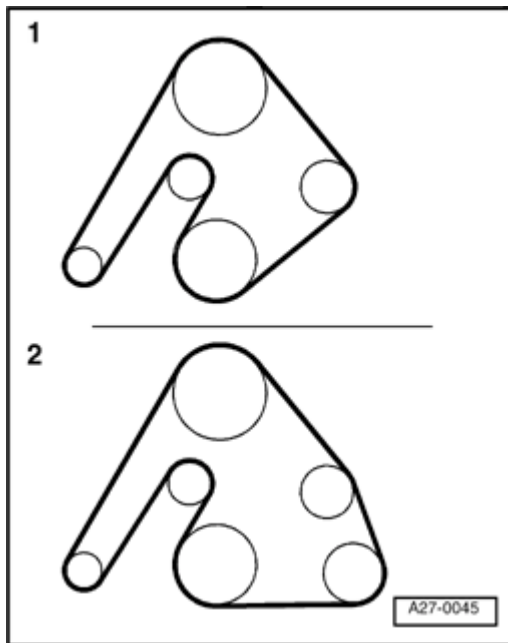
- Remove socket head bolt -1- and lock nut -2-.
Tightening torque: 45 Nm (33 ft lb)
- Loosen bolt -3-.
Tightening torque: 22 Nm (16 ft lb)
- Remove generator -4- from below.

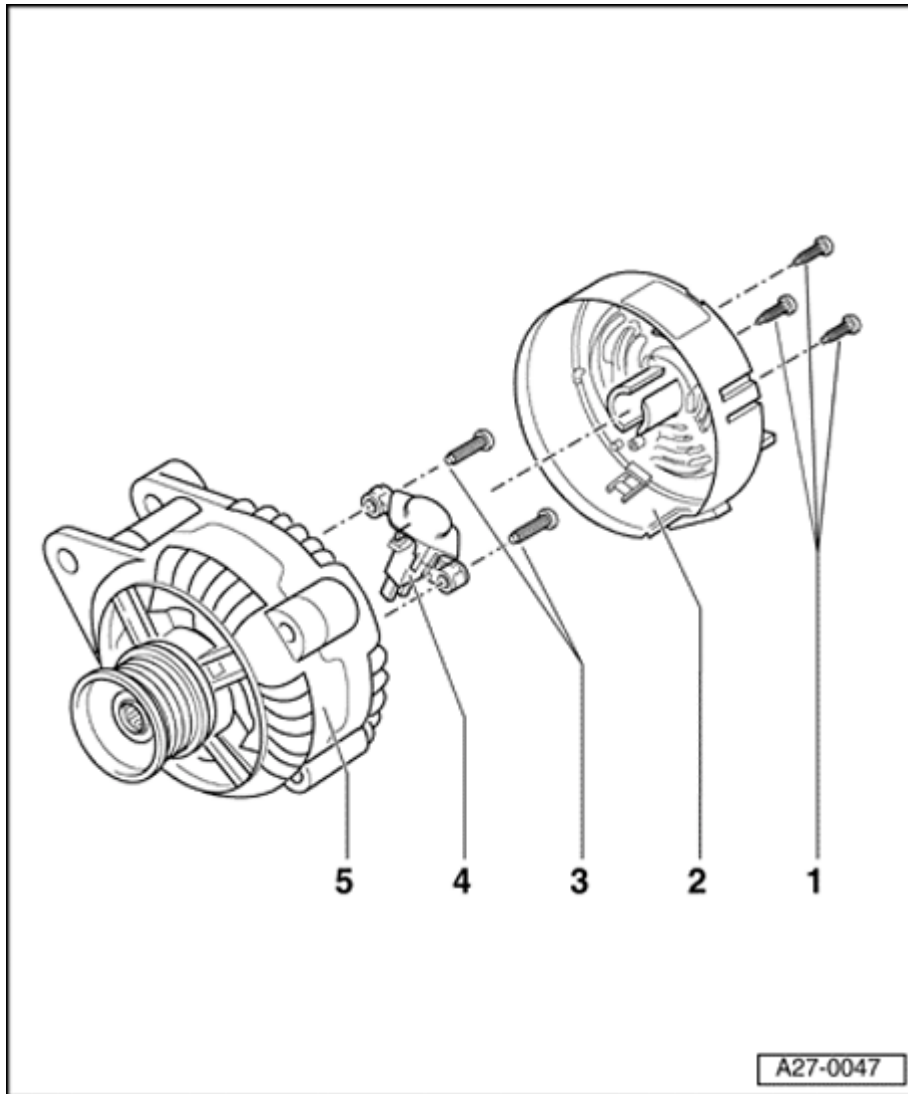
CAUTION!

When removing the generator, be careful not to damage the refrigerant lines.

Installing

- To make it easier to install generator onto mount, drive bushing for mounting bolt back approx. 1 mm.
 - Install generator in reverse order of removal.
- 4
- Make sure ribbed belt is properly seated and correctly routed.
- 1 - Without air conditioning
2 - With air conditioning





Voltage regulator, replacing

Model: Bosch

1 - Phillips-head screws

- ◆ 1 Nm (9 in. lb)

2 - Protective cover

- ◆ 3 snap catches

3 - Slotted screws

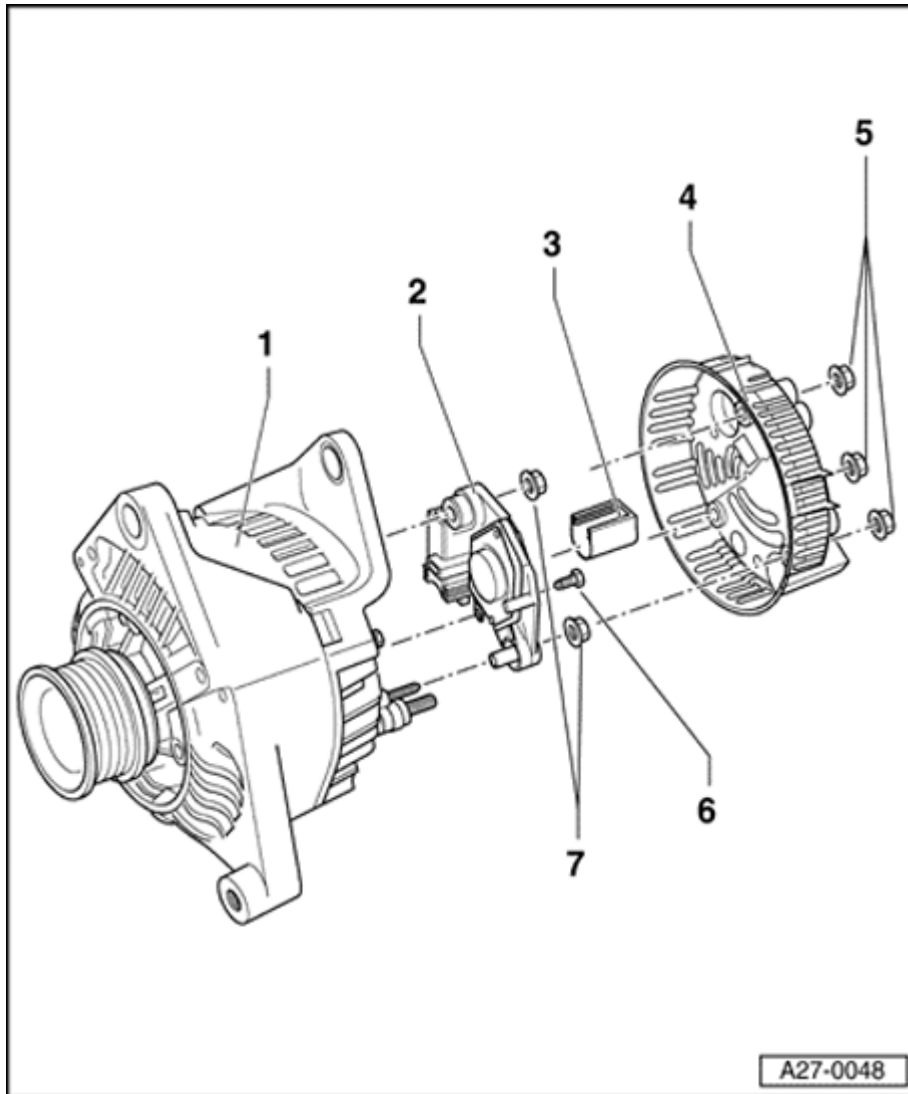
- ◆ M4 = 2 Nm (18 in. lb)

4 - Voltage regulator

- ◆ Removing and installing⇒ items - 1 -, - 2 - and - 3 -

- ◆ Wear limit for carbon brushes: 5 mm

5 - Generator

**Model: Valeo****1 - Generator****2 - Voltage regulator**

- ◆ Removing and installing ⇒ items - 4 -, - 5 -, - 6 - and - 7 -

- ◆ Wear limit for carbon brushes: 5 mm

3 - Cover

- ◆ Push off before mounting voltage regulator; press on after mounting

4 - Protective cover**5 - Flanged nuts**

- ◆ 2 Nm (18 in. lb)

6 - Screw

- ◆ 2 Nm (18 in. lb)

7 - Flanged nuts

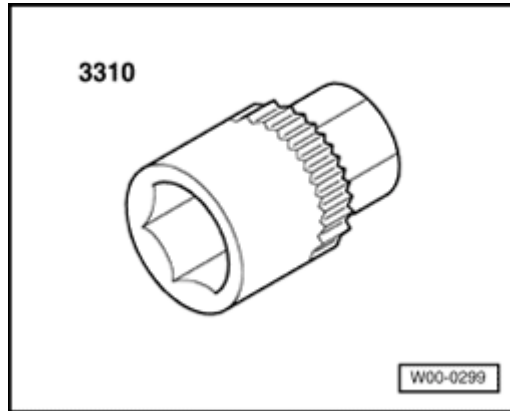
- ◆ 3.5 Nm (31 in. lb)

Ribbed belt pulley, removing and installing

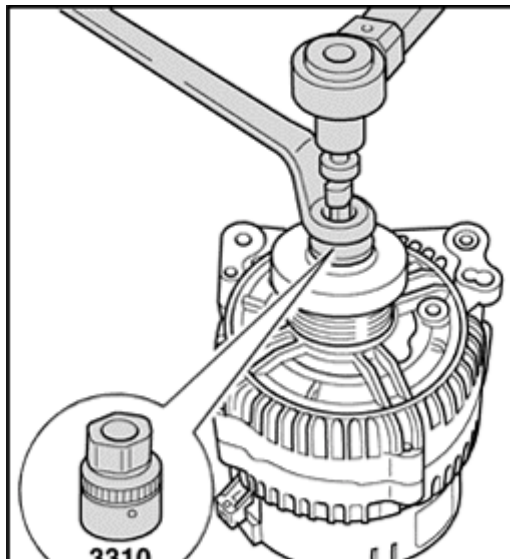
Special tools, test equipment and auxiliary items



3310 socket



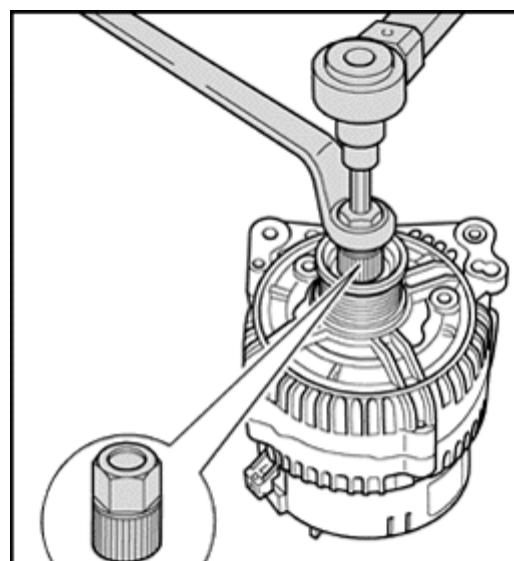
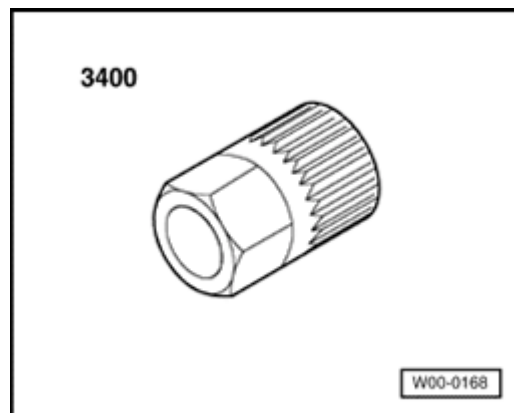
- Counterhold mounting nut using 3310 socket.
 - ◆ Removing: rotate generator shaft to right
 - ◆ Installing: rotate generator shaft to left
 - ◆ Tightening torque: 65 Nm (48 ft lb)



Ribbed belt pulley with freewheel, removing and installing

Special tools, test equipment and auxiliary items

- 3400 multi-tooth adapter



- - Counterhold belt pulley using 3400 multi-tooth adapter.
 - ◆ Removing: rotate generator shaft to right
 - ◆ Installing: rotate generator shaft to left
 - ◆ Tightening torque: 80 Nm (59 ft lb)
 - Clip protective cover onto freewheel belt pulley.

Starter, removing and installing

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *Once the battery is reconnected, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as described in this Repair Manual or the Owners Manual.*

27-41

Vehicles with 4-cylinder gasoline engines

Removing



- Remove noise insulation panel (arrows).

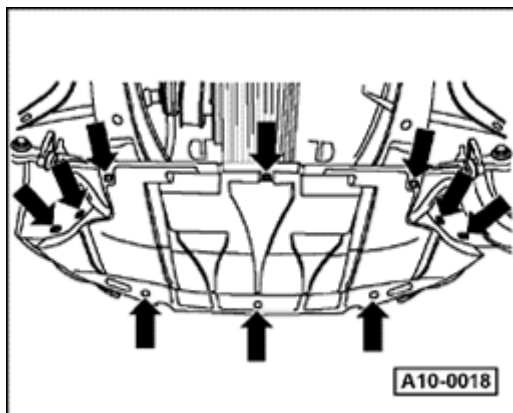
Vehicles with air conditioning

- Remove front bumper.

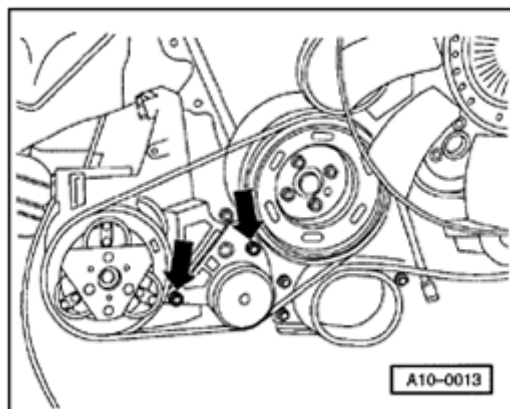
⇒ [Repair Manual Body Exterior, Repair Group 63](#)

- Move lock carrier into service position.

⇒ [Repair Manual Body Exterior, Repair Group 50](#)



27-42



A

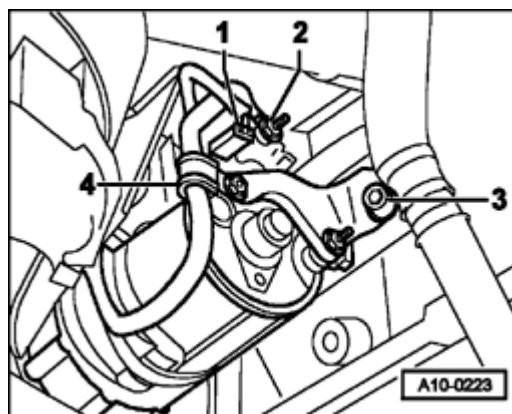
- Loosen mounting bolts for air conditioning compressor belt tensioner (arrows).
- Release tension on ribbed belt and remove.

Note:

Before removing the ribbed belt, mark the direction of travel with chalk or a felt tipped marker. Reversing the direction of travel of an used belt can destroy it. When installing the belt, make sure it is correctly seated in the belt pulleys.

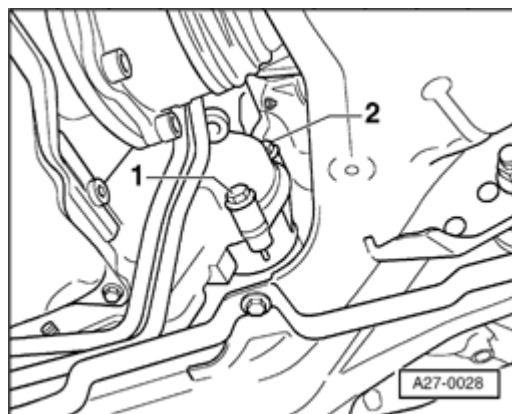
- Unbolt air conditioning compressor.
Tightening torque: 25 Nm (18 ft lb)
- Hang air conditioning compressor up on chassis with its refrigerant lines attached.

27-43



A

- Disconnect wire from terminal 30/B+ by removing nut -2-.
Tightening torque: 16 Nm (12 ft lb)
- Disconnect harness connector -1- from terminal 50.
- Remove bolt -3-.
Tightening torque: 22 Nm (16 ft lb)
- Unbolt wiring clamp -4-.
Tightening torque: 4 Nm (35 in. lb)



A

- Remove starter mounting bolts -1- and -2-.
Tightening torque: 65 Nm (48 ft lb)
- Remove starter toward front.

Installing

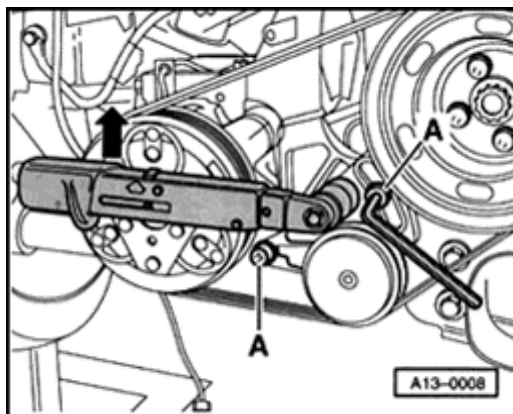
Installation is the reverse of removal; noting the following:

Vehicles with air conditioning

- Install ribbed belt for air conditioning compressor.
- Place torque wrench on hex head of belt tensioner as shown and tighten to 25 Nm (18 ft lb).
- Maintain torque on belt tensioner and tighten bolt -A- to 20 Nm (15 ft lb).

All vehicles

- Start engine and make sure belt runs properly.



Vehicles with 6-cylinder gasoline engines

Removing

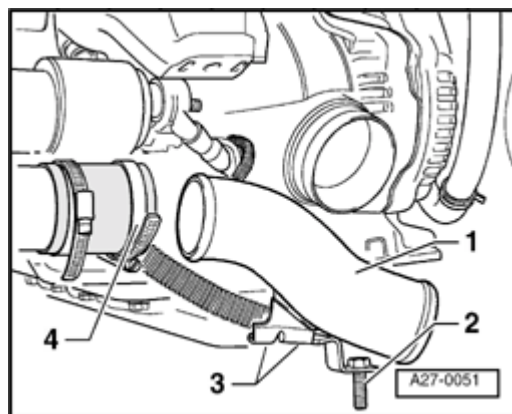
Note:

To remove the starter, it is first necessary to remove the generator ⇒ [Page 27-26](#).

2.7 L/184 kW engine, 5V twin-turbo only

A

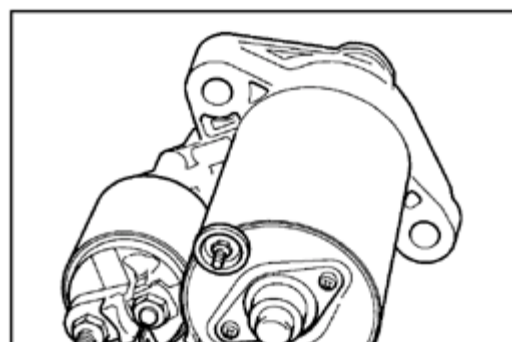
- Remove air duct -1-.
- 2 - Attachment point for oil and refrigerant lines
- 3 - Engine block mounting point
- 4 - Hose clamp (loosen)



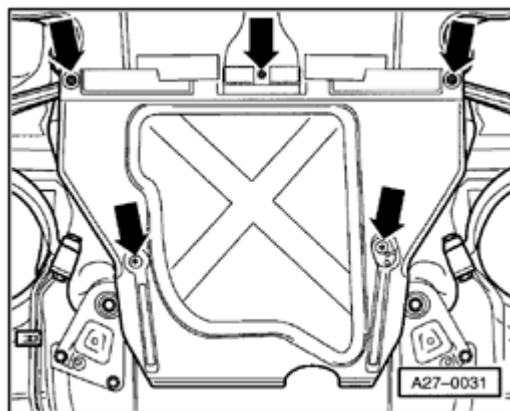
All vehicles

A

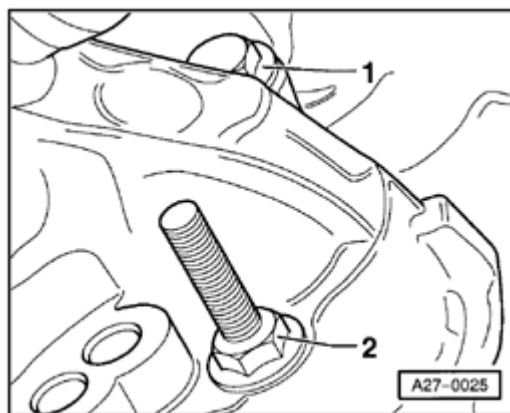
- Disconnect wire from terminal 30/B+ -2- by removing nut. Tightening torque: 16 Nm (12 ft lb)
- Disconnect harness connector from terminal 50 -2-.



27-46

Vehicles with manual transmission

- Remove rear noise insulation panel (arrows).

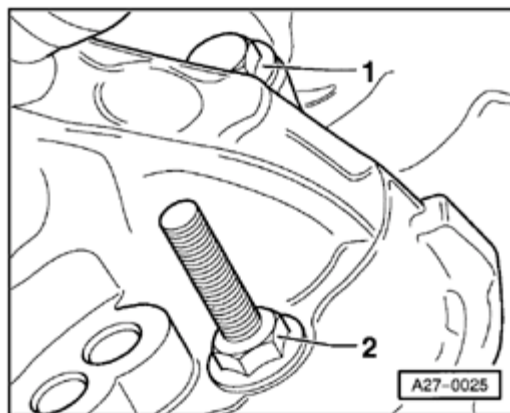


- Remove mounting bolts -1- and -2- for starter.
Tightening torque: 65 Nm (48 ft lb)
- Remove starter toward front.

27-47

Vehicles with automatic transmission

- Remove right-front wheel.
- Upper bolt -1- can be unscrewed from right-front wheel housing.
Tightening torque: 65 Nm (48 ft lb)
- From engine side, remove lower bolt.
Tightening torque: 65 Nm (48 ft lb)
- Remove starter toward front.

**Installing**

- Install starter in reverse order of removal.

Cruise control system, removing and installing

Cruise control system for vehicles with diesel engines

In vehicles with diesel engines, the functions of the cruise control system are controlled by the fuel injection control module.

Aside from the cruise control switch in the turn signal lever, there are no additional components.

Cruise control system for vehicles with 4 and 6-cylinder gasoline engines

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *Once the battery is reconnected, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owners Manual.*

Vehicles with electronically-operated throttle valve

In vehicles with fuel injection, the functions of the cruise control system are controlled by the fuel injection control module.

Aside from the cruise control switch in the turn signal lever, there are no additional components.

Vehicles with mechanically-operated throttle valve

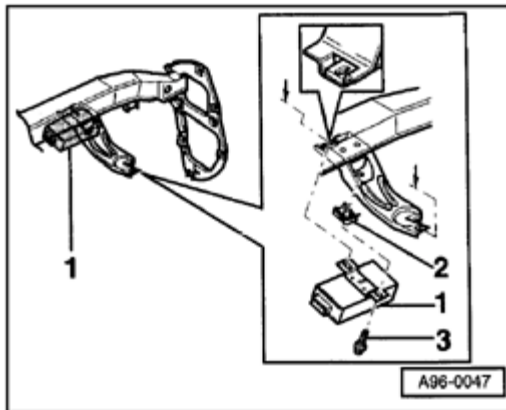
The cruise control, control module -J213- is located behind the airbag unit on the passenger side.

Cruise control, control module -J213-, removing and installing

Follow the sequence of operations below:

- Remove glove box.

⇒ [Repair Manual Body Interior, Repair Group 68](#)



4

- Detach control module -1- by removing Phillips-head screw -3- from clip nut -2-.
- Tightening torque: 3 Nm (27 in. lb)
- Withdraw control module from mounting bracket and disconnect harness connector.

Actuator linkage, adjusting



4-cylinder engines

Depending on the engine, only the installation position of the linkage varies in the different 4-cylinder engines.

Follow the sequence of operations below:

- Start engine and allow to idle (throttle valve at idle).
- Screw in linkage -2- up to stop and then turn back one turn ($360^{\circ} \pm 90^{\circ}$).

The play -a- between linkage -2- and actuator -1- must be 0.5-1.0 mm.

- Secure linkage from moving (locknut).

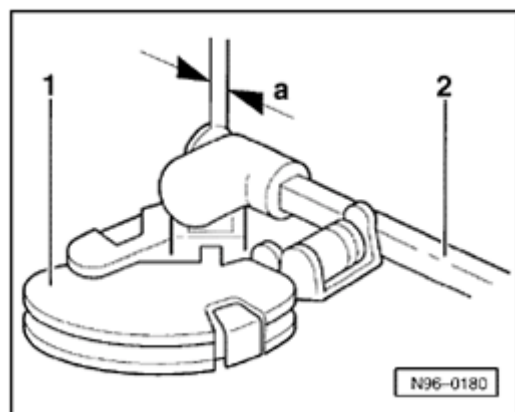
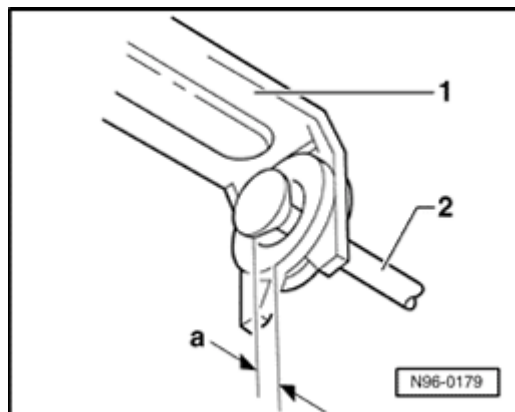


6-cylinder engines

The adjustment is the same as on the 4-cylinder engine.

The play -a- between linkage -2- and the stop plate on cam plate -1- must be 0.5-1.0 mm.

- Secure linkage from moving (locknut).



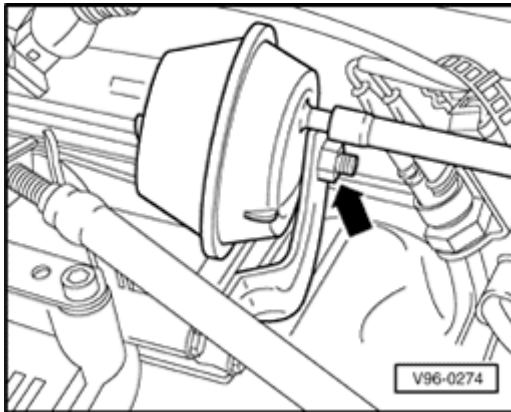
Actuator, removing and installing

Depending on the engine, the installation position of the individual actuators can vary.

Follow the sequence of operations below:

- Remove vacuum line.
- Unscrew or unclip linkage.
- Disconnect actuator from bracket (arrow).

Tightening torque: 25 Nm (18 ft lb)



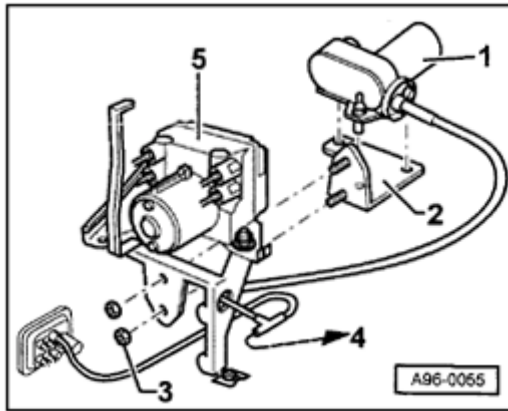
Vacuum pump, removing and installing

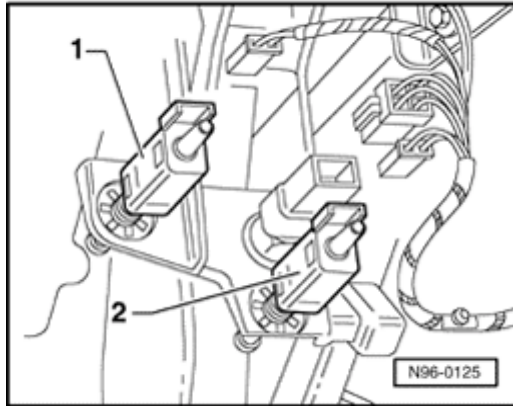
The vacuum pump is located under the ABS unit and can be removed after removing the left-front wheel housing liner.

Follow the sequence of operations below:

A

- Remove retaining nuts -3- (5 Nm or 44 in. lb) and remove unit toward left through wheel housing.
 - Lift vacuum pump -1- complete with its rubber nubs up and out of bracket -2-.
- 4 - Vacuum line routing to actuator





Vent valves, removing and installing



Follow the same procedure for both valves when removing and installing the clutch pedal vent valve -1- and the brake pedal vent valve -2-.

Removing

Follow the sequence of operations below:

- Disconnect harness connector and vacuum line.
- Push or rotate vent valve out of its bracket.

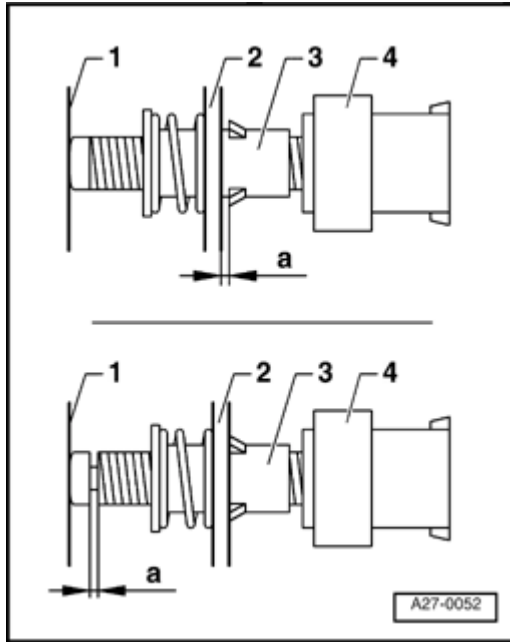
Installing

Note:

To ensure that the valve is seated firmly enough, the valve may only be re-installed once.

- Pedal in released position
- Push vent valve into bracket as far as stop (e.g. using 10 mm box wrench); do not rotate it in.

27-55



⚡ A new bracket is being used as of model year 1998 ➤.

After installation, the vent valve must be in the following position:

a - 0 - 0.7 mm

1 - Pedal stop surface

2 - Pedal bracket

3 - Bracket

4 - Vent valve

- Connect harness connector and vacuum line.

Cruise control vacuum system, checking for leaks

Follow the sequence of operations below:

- Remove vacuum line from vacuum pump.
- Push diaphragm on actuator inward.
- Plug removed vacuum line.
- If actuator diaphragm remains pressed and does not move: system is airtight
- If actuator diaphragm returns to its original position: system has a leak

Note:

Malfunctions can be caused by incorrectly set vent valves, leaking actuators or by cracks in the vacuum lines.

Instrument cluster (through M.Y. 1999)

Instrument cluster, removing and installing

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

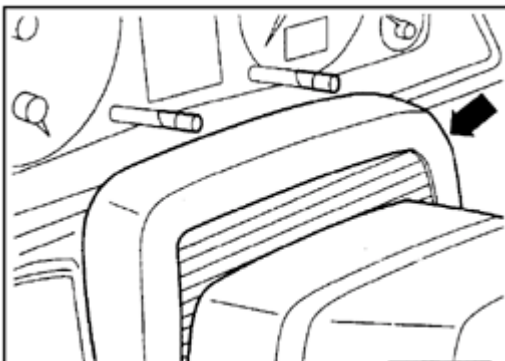
- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *Once the battery is reconnected, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

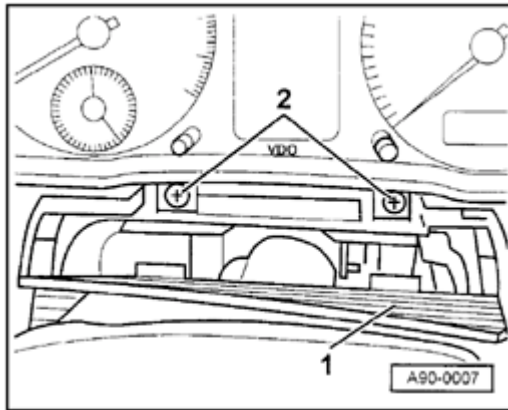
Notes:

- ◆ Check DTC memory (⇒ [Page 01-10](#)) before removing the instrument cluster.
- ◆ Use the VAG1551 scan tool to check the Service Reminder Indicator (SRI) and odometer readings and record the displayed values ⇒ [Page 01-32](#) .

Two versions of the instrument cluster are manufactured by various companies:

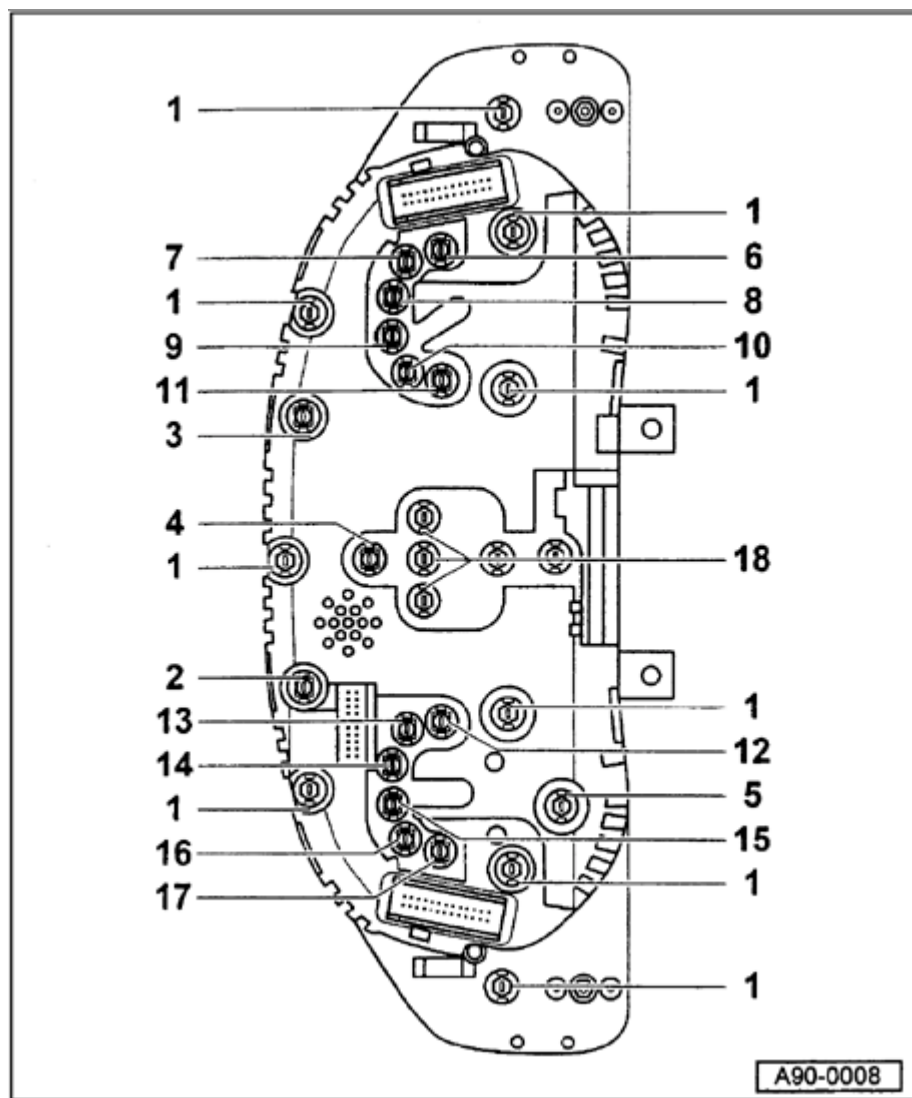
- ◆ Raised version (Highline) with trip computer.
- ◆ Standard version (Lowline) with mini-check system.
- Using steering column adjustment, fully extend steering wheel and move it to its lowest position.
- Pivot top cover toward front and lift off.

**A**



A

- Pivot cover trim -1- away toward front.
- Remove screws -2-.
- Pull instrument cluster out, toward front.
- Cut open tie wraps on back of instrument cluster.
- Release retaining tabs on harness connectors and disconnect.
- Install in reverse order of removal.
- Check instrument cluster function after installation.
- If instrument cluster is working properly, initiate adaptation of Service Reminder Indicator (SRI) and service interval ⇒ [Page 01-32](#) .



Instrument cluster bulbs, locations (through 1997)

Highline version of instrument cluster with trip computer

1 - Instrument cluster illumination

Note:

When replacing instrument cluster bulbs in instrument clusters manufactured by Nippon Seiki, make sure to use replacement bulbs with red caps.

2 - Right turn signal indicator light

◆ 1.2 W

3 - Left turn signal indicator light -K65-

◆ 1.2 W

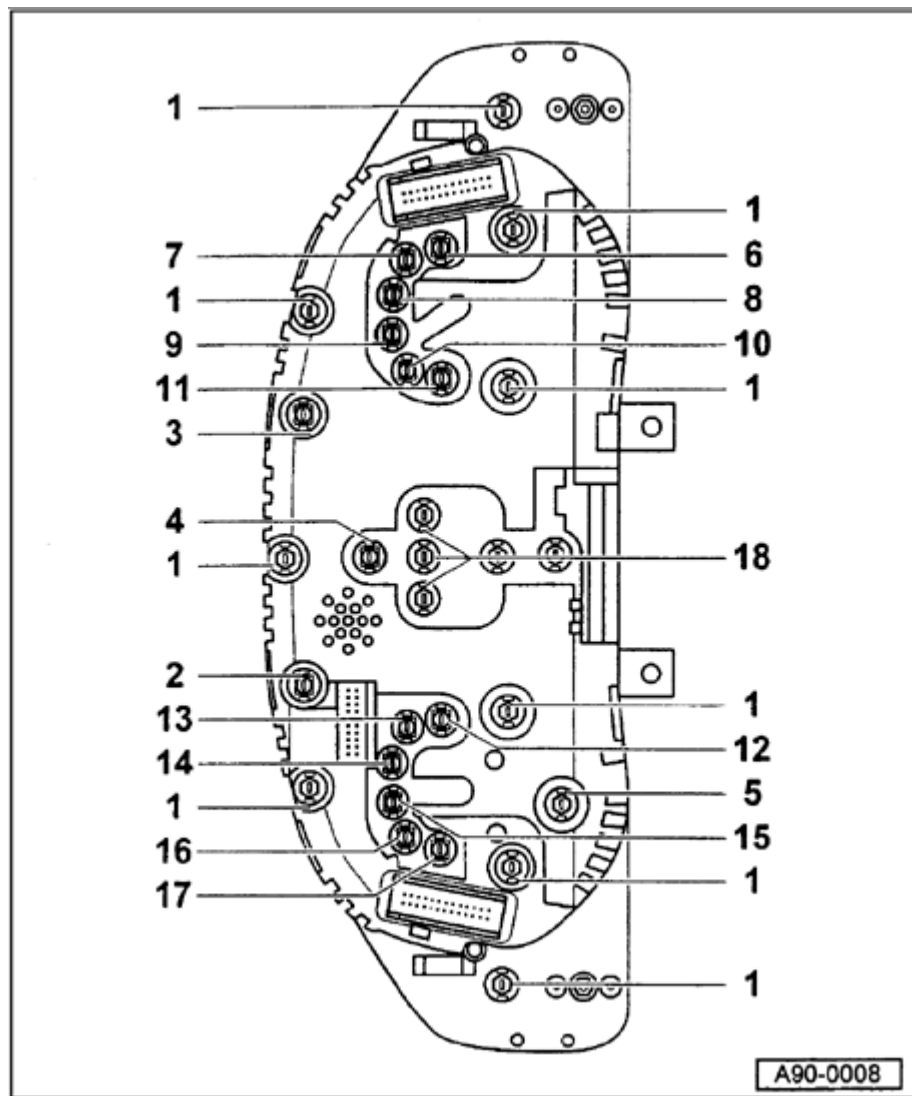
4 - Headlight high beam indicator light

◆ 1.2 W

5 - Odometer display illumination

◆ 1.1 W

90-5

**6 - Engine Malfunction Indicator Lamp (MIL)**

◆ 1.2 W

7 - Open**8 - Open****9 - Open****10 - Open****11 - Open****12 - Open****13 - Airbag Malfunction Indicator Lamp (MIL)**

◆ 1.2 W

14 - ABS warning light

◆ 1.2 W

15 - Parking brake indicator light

◆ 1.2 W

16 - Generator (GEN) warning light

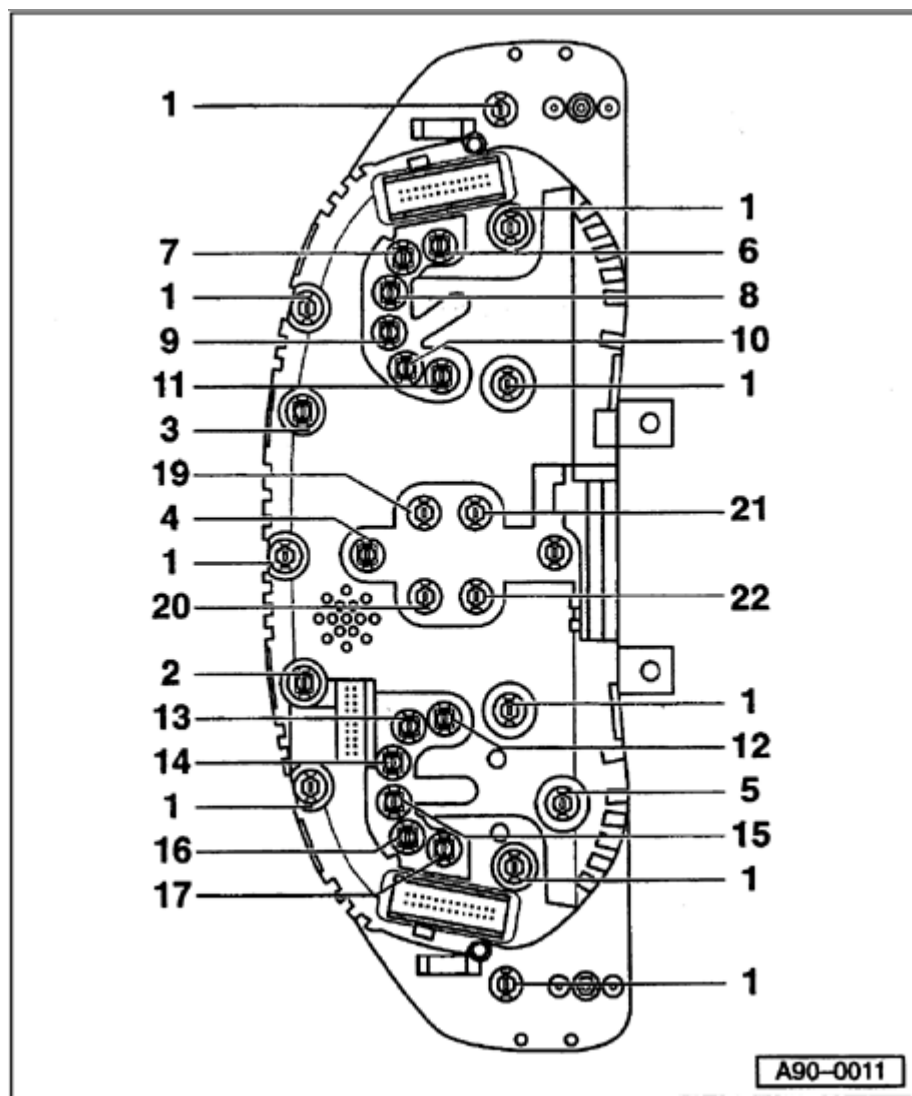
◆ 1.2 W

17 - Seat belt warning light

◆ 1.2 W

18 - Trip computer illumination

◆ 5 each 1.1 W



Lowline version instrument cluster with mini-check system

1 - Instrument cluster illumination

Note:

When replacing instrument cluster bulbs in instrument clusters manufactured by Nippon Seiki, make sure to use replacement bulbs with red caps.

2 - Right turn signal indicator light

◆ 1.2 W

3 - Left turn signal indicator light -K65-

◆ 1.2 W

4 - Headlight high beam indicator light

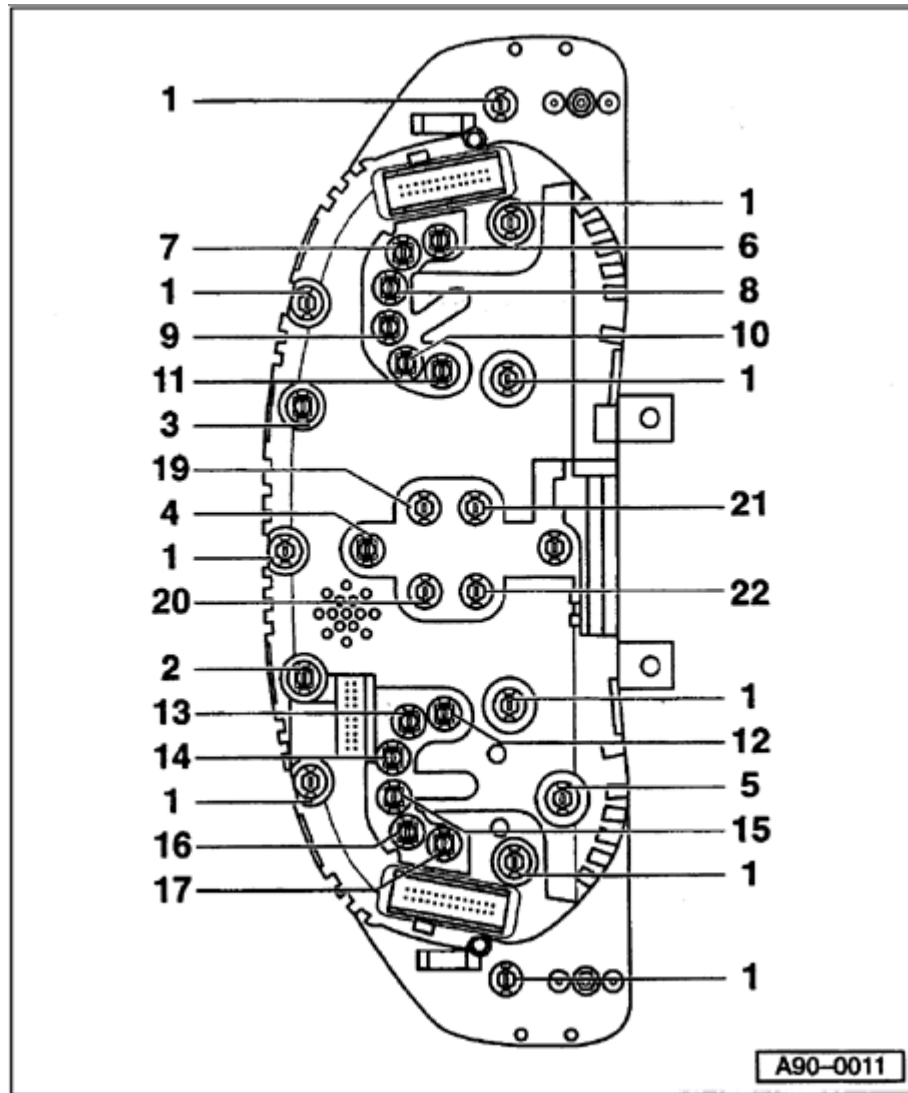
◆ 1.2 W

5 - Odometer display illumination

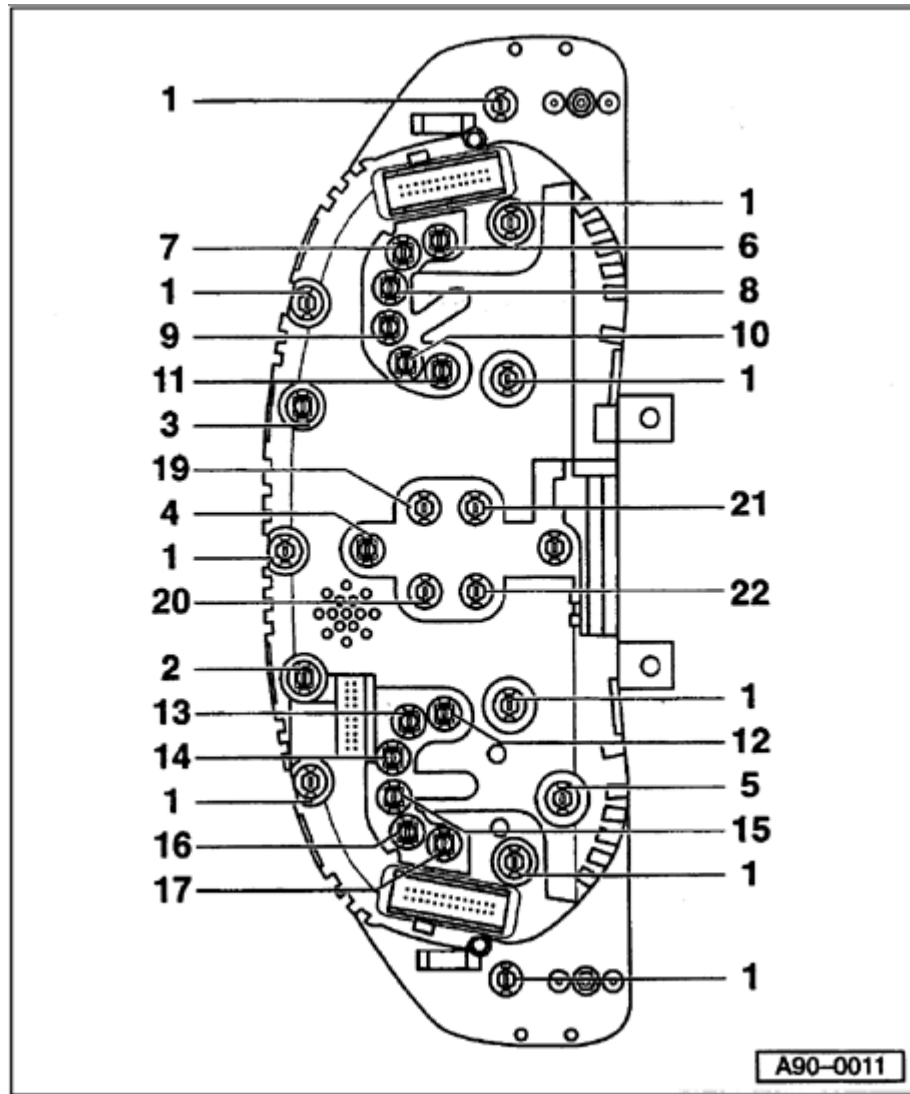
◆ 1.1 W

6 - Engine Malfunction Indicator Lamp (MIL)

◆ 1.2 W



- 7 - Open
- 8 - Open
- 9 - Open
- 10 - Open
- 11 - Open
- 12 - Open
- 13 - Airbag Malfunction Indicator Lamp (MIL)
 - ◆ 1.2 W
- 14 - ABS warning light
 - ◆ 1.2 W
- 15 - Parking brake indicator light
 - ◆ 1.2 W
- 16 - Generator (GEN) warning light
 - ◆ 1.2 W
- 17 - Seat belt warning light
 - ◆ 1.2 W



19 - Engine Coolant Temperature (ECT) warning light

◆ 1.2 W

20 - Oil pressure warning light

◆ 1.2 W

21 - Brake malfunction indicator light

◆ 1.2 W

22 - Low fuel level warning light

◆ 1.2 W

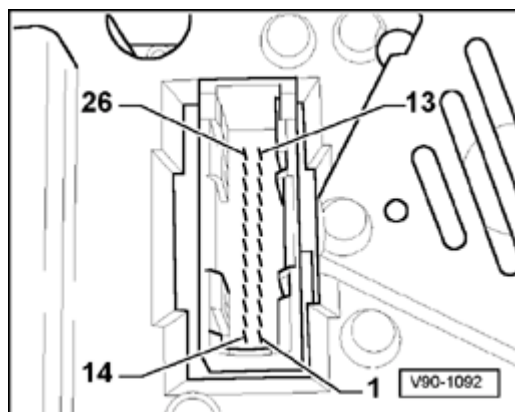
Instrument cluster multi-pin connector, terminal assignments (through 1997)



26-pin connector (blue)

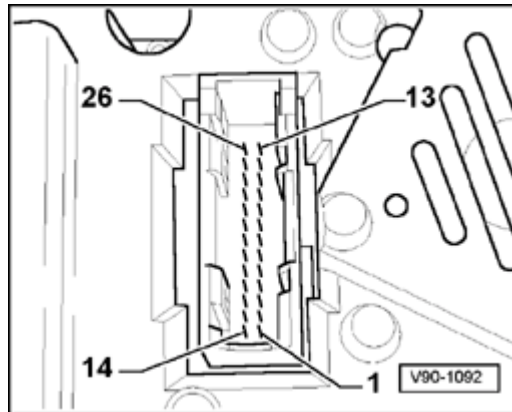
Note:

Use VAG1598/4 adapter with VAG1598 test box and appropriate wiring diagram for test measurements at 26-pin harness connectors.



- 1 - Open
- 2 - Signal for buzzer
- 3 - Terminal 15
- 4 - Terminal 15
- 5 - Open
- 6 - Terminal 61
- 7 - Parking brake/brake system malfunction
- 8 - ABS (input signal)
- 9 - Airbag (input signal)
- 10 - CAT
- 11 - Open
- 12 - Open

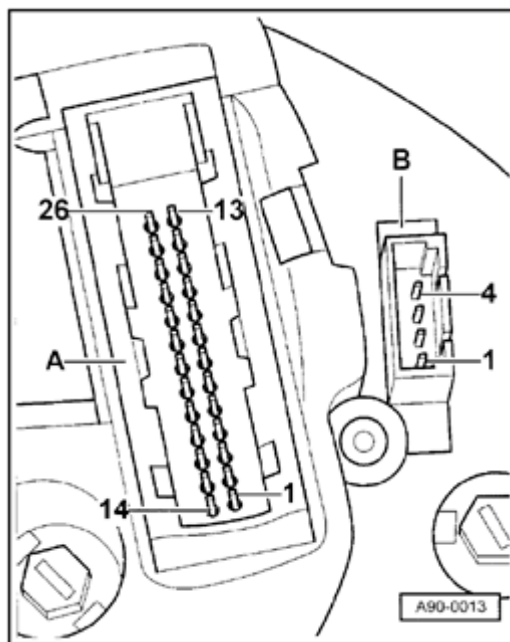
90-10



A

- 13 - Parking light, right
- 14 - Ignition switch, S-contact
- 15 - Chime signal
- 16 - Open
- 17 - Open
- 18 - Oil pressure 1.8 bar
- 19 - Terminal 58d
- 20 - Coolant level
- 21 - Turn signal, right
- 22 - Headlight high beams
- 23 - Speedometer Vehicle Speed Sensor (VSS) (checking ⇒ [Page 90-22](#))
- 24 - Brake fluid
- 25 - Brake pads
- 26 - Parking light, left

90-11



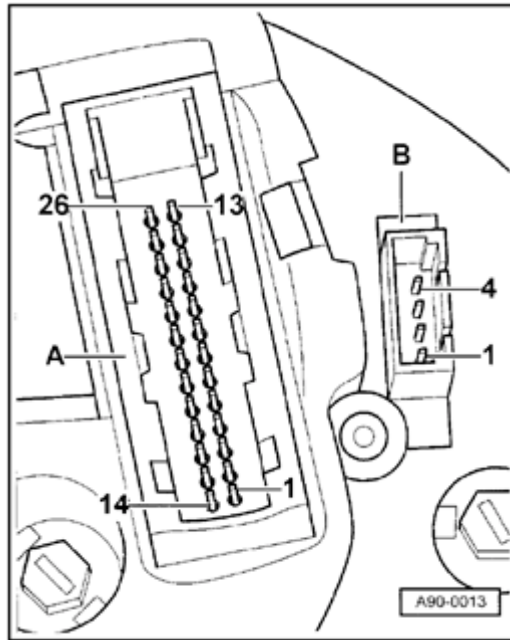
26-pin connector (yellow)

Note:

Use VAG1598/4 adapter with VAG1598 test box and appropriate wiring diagram for test measurements at 26-pin harness connectors.

- 1 - Terminal 58
- 2 - Terminal 58
- 3 - Engine RPM signal
- 4 - Air conditioner compressor
- 5 - Clock (output)
- 6 - Speed signal 1
- 7 - Speed signal 2
- 8 - Door contact (driver's door)
- 9 - Terminal 30
- 10 - Terminal 30
- 11 - Open
- 12 - Fuel tank warning

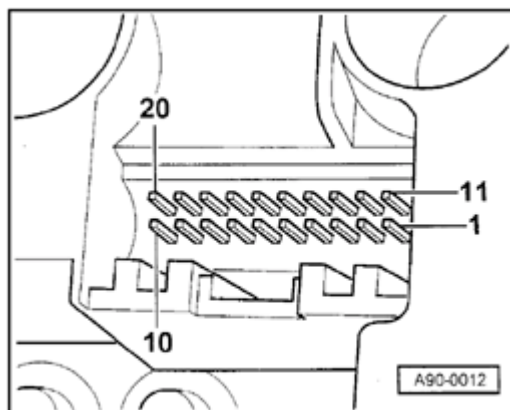
90-12



A

- 13 - Turn signal, left
- 14 - Open
- 15 - Open
- 16 - Seat belt buckle switch
- 17 - Open
- 18 - Terminal 31
- 19 - Terminal 31
- 20 - Diagnostic wire
- 21 - Open
- 22 - Open
- 23 - Open
- 24 - Open
- 25 - Sender for fuel gauge
 - Checking ⇒ [Page 90-23](#)
- 26 - Engine coolant temperature sensor
 - Checking ⇒ [Page 90-24](#)

90-13

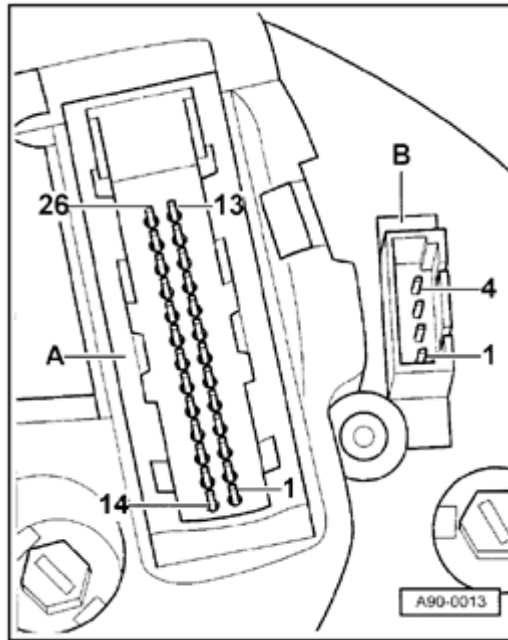


20-pin connector (black)

- 1 - Fuel consumption signal
- 2 - Open
- 3 - Open
- 4 - Open
- 5 - Outside air temperature
- 6 - Selector lever display
- 7 - Open
- 8 - Open
- 9 - Coolant level
- 10 - Hydraulic pressure
- 11 - Trip computer - Reset
- 12 - Radio/Telephone - Clock
- 13 - Radio/Telephone - Data
- 14 - Trip computer (forward sequence)
- 15 - Radio/Telephone - Enable
- 16 - Rear lights/headlight low beams
- 17 - Open
- 18 - Trip computer (reverse sequence)
- 19 - Brake lights

20 - Open

90-14

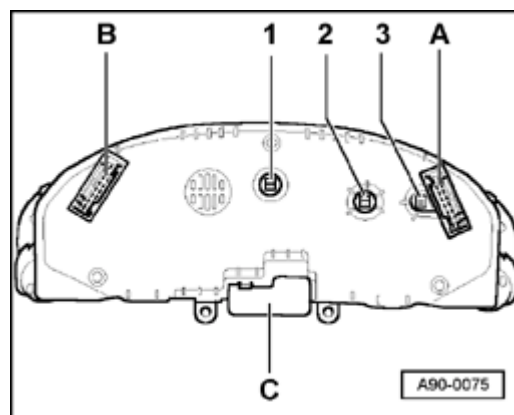
**4-pin connector (black)**

- 1 - Oil temperature sensor
- 2 - Open
- 3 - Open
- 4 - Open

Indicator lights in instrument cluster, locations (1998 through 1999)

Note:

With the exception of two indicator lights, all the remaining indicator lights are equipped with Light Emitting Diodes (LEDs). This means that if one LED fails, the instrument cluster must be replaced.



Lowline instrument cluster

1 - High beam indicator lamp - 1.2 W/1.1 W (Nippon Seiki)/ (VDO)

2 - Indicator light for Electronic Stability Program (ESP) - 1.2 W (only if equipped with ESP)

3 - Indicator light for trailer flasher - 1.2 W (only if equipped with trailer hitch)

A - 32-pin connector for basic functions, blue

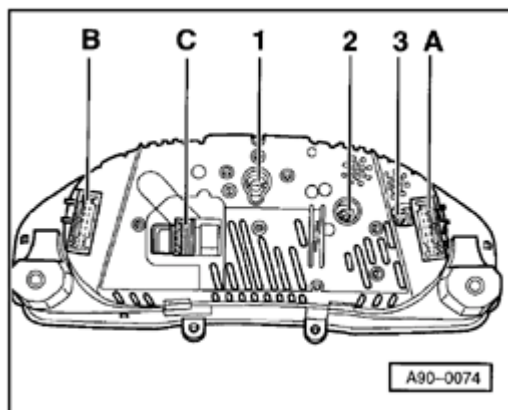
B - 32-pin connector for additional functions, green

C - Cover for vehicles without outside temperature display

Note:

If the instrument cluster is replaced in vehicles with outside temperature display or if outside temperature display is added later, cover -C- must be removed from the Lowline model.

90-16



Highline instrument cluster

1 - High beam indicator lamp - 1.2 W/1.1 W (Nippon Seiki)/ (VDO)

2 - Indicator light for Electronic Stability Program (ESP) - 1.2 W (only if equipped with ESP)

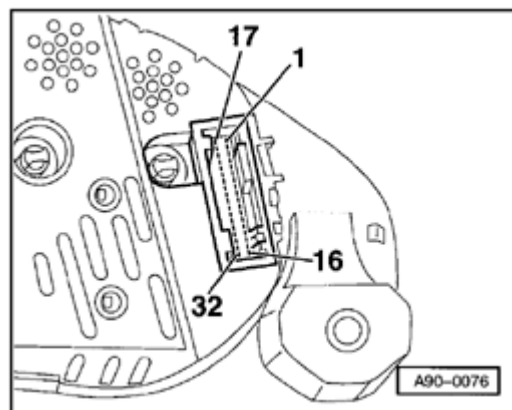
3 - Indicator light for trailer flasher - 1.2 W (only if equipped with trailer hitch)

A - 32-pin connector for basic functions, blue

B - 32-pin connector for additional functions, green

C - 20-pin connector for multi-function display

90-17



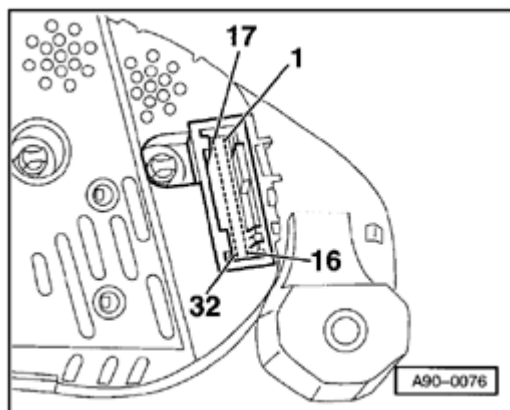
Instrument cluster, terminal assignments (1998 through 1999)



32-pin connector for basic functions, blue

- 1 - Terminal 15
- 2 - Turn signal, right
- 3 - Speedometer output 1
- 4 - Open
- 5 - Sender for fuel gauge
- 6 - Airbag
- 7 - Terminal 31 sensor Ground (GND)
- 8 - Coolant temperature
- 9 - Terminal 31 load Ground (GND)
- 10 - Oil pressure switch
- 11 - Engine speed (RPM) signal
- 12 - Terminal 61
- 13 - CAT
- 14 - Self leveling suspension
- 15 - Terminal 58d
- 16 - Malfunction Indicator Lamp (MIL)

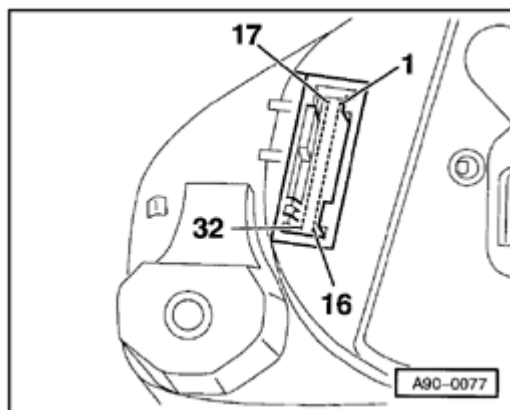
90-18



A

- 17 - High beam
- 18 - Turn signal, left
- 19 - ABS
- 20 - Terminal 58s
- 21 - Door contact (driver's door)
- 22 - Engine coolant low
- 23 - Terminal 30
- 24 - Terminal 31 load Ground (GND)
- 25 - K-wire
- 26 - Parking light, right
- 27 - Parking light, left
- 28 - Speedometer (input)
- 29 - Brake fluid level/pressure
- 30 - S-contact
- 31 - Seat belt buckle
- 32 - Electronic Stability Program (ESP)

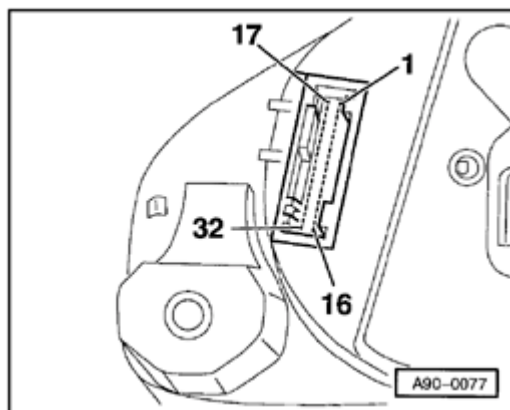
90-19



32-pin connector for additional functions, green

- 1 - Open
- 2 - Open
- 3 - Open
- 4 - Open
- 5 - W-wire
- 6 - Tailgate (Lowline model only)
- 7 - Brake pad (Highline model only)
- 8 - Input for outside buzzer control (currently not assigned)
- 9 - Input for outside chime control (currently not assigned)
- 10 - Low fuel level warning-output signal for Engine Control Module (ECM)
- 11 - Standing time output
- 12 - Air conditioning cutout
- 13 - Parking brake
- 14 - Electronic throttle
- 15 - Side marker light
- 16 - Open

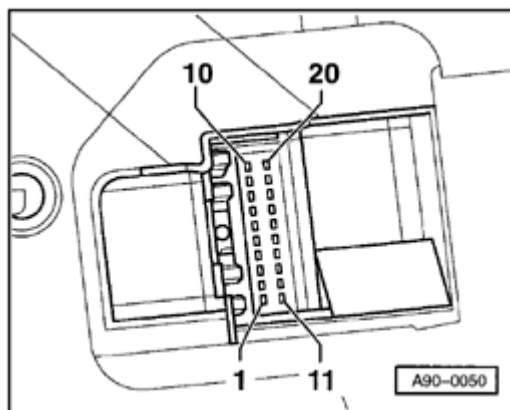
90-20



A

- 17 - Open
- 18 - Open
- 19 - Open
- 20 - Open
- 21 - Oil temperature
- 22 - Open
- 23 - Open
- 24 - Open
- 25 - Open
- 26 - Open
- 27 - Open
- 28 - Open
- 29 - Open
- 30 - Speedometer output 2
- 31 - Open
- 32 - Open

90-21



20-pin connector for multi-function display, red

- 1 - Fuel consumption signal
- 2 - Open
- 3 - Open
- 4 - Open
- 5 - Outside air temperature
- 6 - Selector lever display
- 7 - Open
- 8 - Open
- 9 - Washer fluid
- 10 - Hydraulic pressure
- 11 - Trip computer reset
- 12 - Clock signal for radio frequency display
- 13 - Data signal for radio frequency display
- 14 - Trip computer (forward sequence)
- 15 - Enable signal for radio frequency display
- 16 - Tail lights/headlight low beam (indicator lights)
- 17 - Open
- 18 - Trip computer (reverse sequence)
- 19 - Brake lights

20 - Open

Instrument cluster multi-pin connectors, checking

Note:

Use VAG1598 test box and VAG1598/4 (26-pin), VAG1598/25 (32-pin) adapters.

Checking Vehicle Speed Sensor (VSS)

➤ 1997

- ◆ 26-pin connector (blue), terminal 23

- Roll vehicle back and forth (approx. 1 meter)

Must read:

Voltage must rise from 0 volts to approx. 5 volts and then drop again to 0 volts.

1998 ➤

- ◆ 32-pin connector (blue), terminal 28

- Roll vehicle back and forth (approx. 1 meter)

Must read:

Ohmic resistance must be between

approximately 0 ohms (Ω) and ∞ ohms (Ω).

Checking sender for fuel gauge

➤ 1997

- ◆ 26-pin connector (yellow), terminal 25

Fuel tank half full: approx. 162 ohms (Ω)

Fuel tank full: approx. 40 ohms

Fuel tank reserve: approx. 250 ohms(Ω)

1998 ➤

- ◆ 32-pin connector (blue), terminal 5

Fuel tank half full: approx. 162 ohms (Ω)

Fuel tank full: approx. 40 ohms

Fuel tank reserve: approx. 250 ohms(Ω)

Checking Engine Coolant Temperature (ECT) sensor

➤ 1997

- ◆ 26-pin connector (yellow), terminal 26

Coolant temperature 90 °C:	approx. 110 ohms (Ω)

Coolant temperature 120 °C:	approx. 50 ohms (Ω)

1998 ➤

- ◆ 32-pin connector (blue), terminal 8

Coolant temperature 90 °C:	approx. 110 ohms (Ω)

Coolant temperature 120 °C:	approx. 50 ohms (Ω)

90-25

Instrument cluster (from M.Y. 2000)

WARNING!

Disconnect battery Ground (GND) cable before performing work on the electrical system.

Notes:

- ◆ Obtain radio code before disconnecting battery.
- ◆ Be sure to activate vehicle features (radio, clock, electric window regulator, engine) according to owner's manual when the battery is re-connected.

Malfunction message "dEF" on trip odometer display

If the control module in the instrument cluster detects a malfunction in its permanent memory, the letters "dEF" will appear on the trip odometer display.

- If "dEF" is indicated on display, replace instrument cluster ⇒ [Page 90-27](#) .

Instrument cluster, removing and installing

Notes:

- ◆ *Do not disassemble instrument cluster.*
- ◆ *Removing the steering wheel is not required.
For clarity, the steering wheel does not appear in the following illustrations.*
- ◆ *Check DTC memory before removing the instrument cluster ⇒ [Page 01-91](#) .*
- ◆ *Also check and write down values of the service display and the odometer reading via the VAG1551 scan tool ⇒ [Page 01-133](#) .*

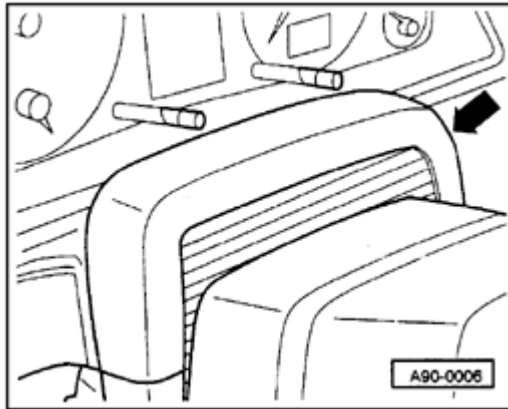
90-28

Removing

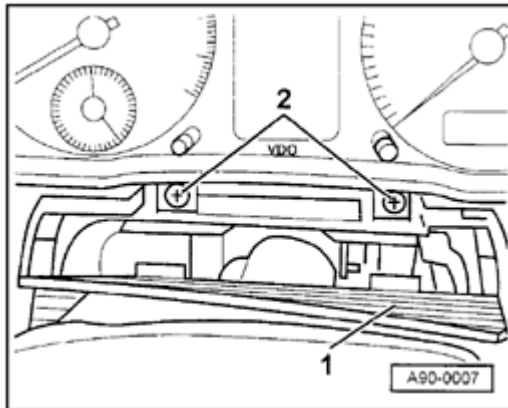
- Using the adjustment mechanism, move steering wheel fully out and downward.

A

- Tilt upper cover forward and remove upward.

**A**

- Flip trim -1- toward front.
- Remove both Phillips-head screws -2-.
- Pull out instrument cluster toward front.
- Cut cable ties at rear of instrument cluster.
- Unclip securing latches of connectors and disconnect connectors.



Installing

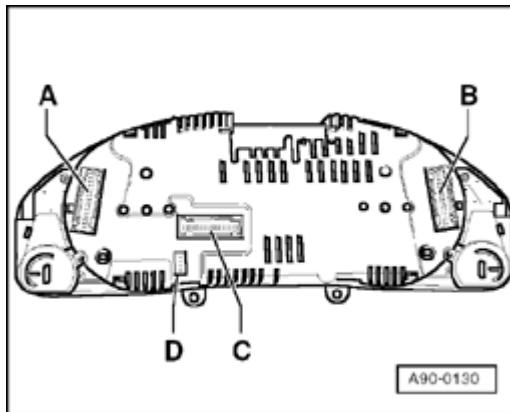
- Connect electrical harness connectors and affix wiring harness to rear of instrument cluster with cable ties.
- To install, perform the steps described for removal in reverse order.
- Perform a function test after installation.
- If function test is OK

observe notes for the replacement of the instrument cluster ⇒ [Page 01-191](#) .

Instrument cluster multi-pin connectors

Note:

On the Audi A4/S4, all control lamps are equipped with LEDs which means that if one control lamp malfunctions the instrument cluster must be replaced.



Midline-instrument cluster

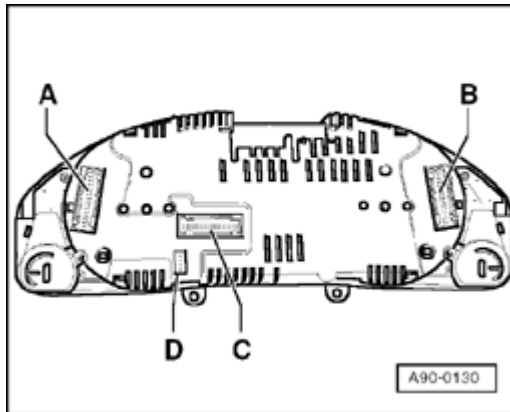
A - Green 32-pin multi-pin connector

B - Blue 32-pin multi-pin connector

C - Discontinued

D - Black 4-pin multi-pin connector for remote clock (not connected in US)

90-31



Highline-instrument cluster

A - Green 32-pin multi-pin connector

B - Blue 32-pin multi-pin connector

C - Gray 32-pin multi-pin connector

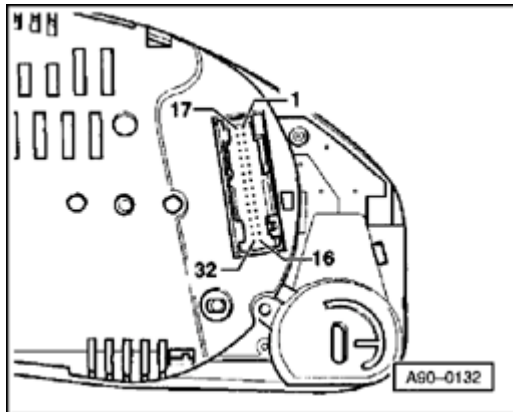
D - Black 4-pin multi-pin connector for remote clock (not connected in US)

Instrument cluster, terminal assignments

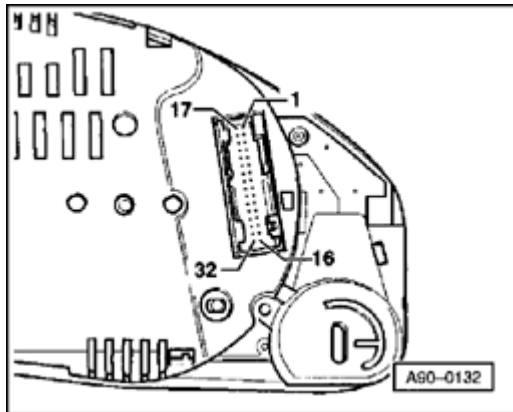


Blue 32-pin multi-pin connector for basic functions

- 1 - Terminal 15
- 2 - Brake pad wear
- 3 - Tachometer output 1
- 4 - not occupied
- 5 - Tank sensor
- 6 - Tank warning OBD 2
- 7 - Terminal 31 (sensor Ground (GND))
- 8 - Coolant temperature
- 9 - Terminal 31 (load Ground (GND))
- 10 - Oil pressure 2 (high)
- 11 - RPM signal
- 12 - A/C shut-off
- 13 - E-Gas/glow plug control
- 14 - Level control
- 15 - Terminal 58d
- 16 - Trailer turn signal



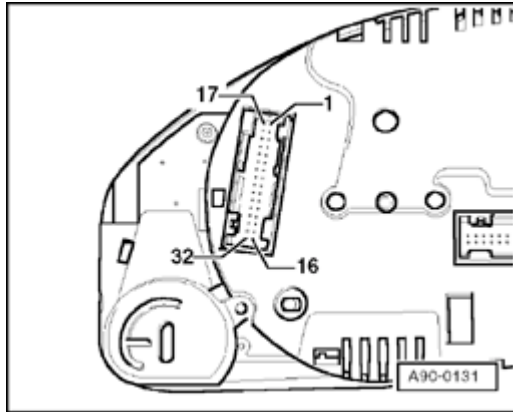
90-33



A

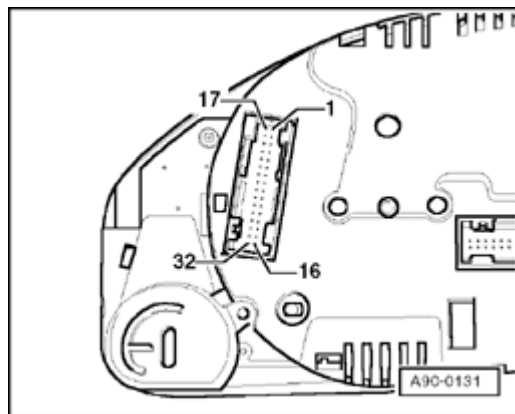
- 17 - High beam
- 18 - Left turn signal
- 19 - not occupied
- 20 - Terminal 58s
- 21 - Driver door contact
- 22 - Low coolant
- 23 - Terminal 30
- 24 - Terminal 31 (load Ground (GND))
- 25 - Consumption signal
- 26 - Right parking light
- 27 - Left parking light
- 28 - Tachometer input
- 29 - Brake
- 30 - S-contact
- 31 - Tachometer output 2
- 32 - ESP/ASR

90-34

**Green 32-pin multi-pin connector for auxiliary functions**

- 1 - Door contact (all doors)
- 2 - Transponder 1
- 3 - not occupied
- 4 - not occupied
- 5 - W-wire
- 6 - Tailgate
- 7 - Right turn signal
- 8 - External buzzer
- 9 - External gong
- 10 - Airbag
- 11 - Stand-still time output
- 12 - Terminal 61
- 13 - Parking brake/BRAKE
- 14 - CHECK
- 15 - Oil level/oil temperature
- 16 - not occupied

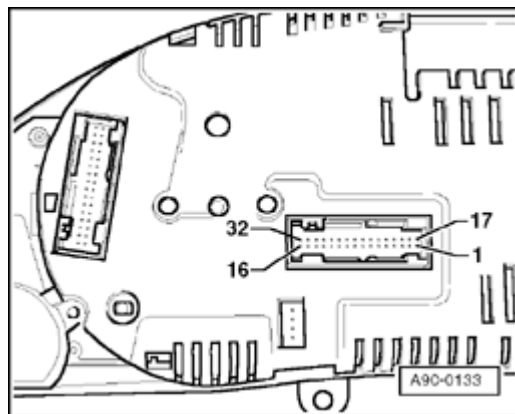
90-35



A

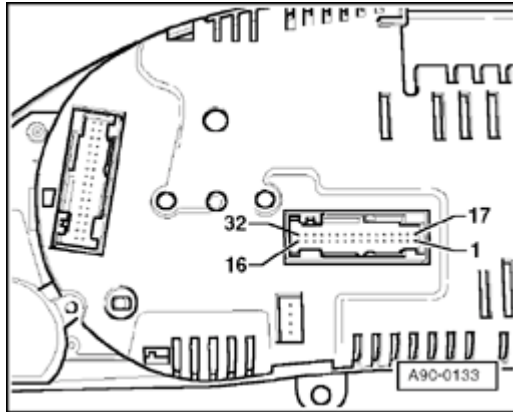
- 17 - Transponder 2
- 18 - CAN high speed (powertrain) (high +)
- 19 - CAN high speed (powertrain) (low -)
- 20 - CAN high speed (powertrain) (screen)
- 21 - ABS
- 22 - CAN low speed (comfort) (high +)
- 23 - CAN low speed (comfort) (low -)
- 24 - CAN low speed (comfort) (screen)
- 25 - Engine lid
- 26 - not occupied
- 27 - Belt buckle
- 28 - K-wire
- 29 - Outside temperature -input
- 30 - not occupied
- 31 - Selector range display
- 32 - not occupied

90-36

**Gray 32-pin multi-pin connector for multi-function display**

- 1 - Menu selection switch (menu)
- 2 - Menu selection switch (out A)
- 3 - Menu selection switch (out B)
- 4 - Menu selection switch (Enter)
- 5 - CAN high speed display (high +)
- 6 - CAN high speed display (low -)
- 7 - CAN high speed display (screen)
- 8 - Passenger door contact
- 9 - Right rear door contact
- 10 - Left rear door contact
- 11 - Enable
- 12 - Clock
- 13 - Data
- 14 - Brake light
- 15 - Windshield washer fluid level
- 16 - Rear lights/low beams

90-37



A

- 17 - Left board computer
- 18 - Right board computer
- 19 - Board computer, reset
- 20 - not occupied
- 21 - not occupied
- 22 - not occupied
- 23 - Button branch 1 navigation
- 24 - Button branch 2 navigation
- 25 - Button branch Telematic
- 26 - not occupied
- 27 - not occupied
- 28 - not occupied
- 29 - not occupied
- 30 - not occupied
- 31 - not occupied
- 32 - not occupied

Engine speed signal, checking

If a malfunction of the RPM display at tachometer is detected, signal at the tachometer must be checked.

- Connect VAS5051 tester or VAG1551 scan tool
⇒ [Page 01-241](#) .
- Read Measuring Value Block ⇒ [Page 01-114](#) .
- Select display group number 001 and perform a road test.

If the speed appears on the VAG1551 Scan Tool display but not via the speedometer in instrument cluster, the instrument cluster is faulty and must be replaced.

If no speed is indicated on the VAG1551 Scan Tool display either, the signal must be checked at multi-function connection at instrument cluster.

- Remove instrument cluster ⇒ [Page 90-27](#) .

- Connect VAG1598 tester with VAG1598/25 adapter to the blue 32-pin connector.
- Perform an acoustic continuity check of the sensor and wire using the VAG1526 multimeter between terminal 28 and socket 9 (load Ground (GND))

Test

The beep signal of the resistance tester must switch on and off several times while the vehicle is rolled slightly forward and backward (approx. 1m)

If the test is not OK, the wire connection to speed sender must be checked.

- Check wire connection according to wiring diagram.

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

If the wire connection is OK, the speed sender must be replaced.

Signal from sender for fuel gauge -G-, checking

If a malfunction of the sender for fuel gauge is detected at instrument cluster, check if the signal at the instrument cluster is OK.

- Connect VAS5051 tester or VAG1551 scan tool
⇒ [Page 01-241](#) .
- Read Measuring Value Block ⇒ [Page 01-114](#) .
- Select display group number 2.

If the fuel level appears on the VAG1551 scan tool display but not via the fuel gauge, the instrument cluster is faulty and must be replaced.

If no speed is indicated on the VAG1551 scan tool display either, the signal must be checked at multi-function connection at instrument cluster.

- Remove instrument cluster ⇒ [Page 90-27](#) .
- Connect VAG1598 tester with VAG1598/25 adapter to the blue 32-pin connector.

- Measure resistance (sensor resistance) between terminal 5 and 7 using VAG1526 multimeter.

Specified values:

Fuel tank empty: approx. 280 Ohm (Front Wheel Drive/All Wheel Drive)

Fuel tank full: approx. 40 Ohm (Front Wheel Drive/All Wheel Drive)

- If the specified values are not reached, check wire connection between instrument cluster and the sender for fuel gauge -G- (Front Wheel Drive/All Wheel Drive) according to wiring diagram.

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

- If there is neither an open circuit nor a short circuit, check the sender for fuel gauge -G- (Front Wheel Drive/All Wheel Drive)
- Sender for fuel gauge, checking

⇒ [Repair Manual, Fuel Supply System, Repair](#)

Group 20; sensor for fuel gauge, checking

- If the specified values are met, the malfunction is in the instrument cluster, meaning that the instrument cluster must be replaced ⇒ [Page 90-27](#) .

Signal from Engine Coolant Temperature (ECT) sensor -G2-, checking

If a malfunction of the Engine Coolant Temperature (ECT) gauge is detected at the instrument cluster, check if the signal at the instrument cluster is OK.

- Connect VAS5051 tester or VAG1551 scan tool
⇒ [Page 01-241](#) .
- Read Measuring Value Block ⇒ [Page 01-114](#) .
- Select display group number 003.

If the Engine Coolant Temperature (ECT) appears on the VAG1551 scan tool display but not by the Engine Coolant Temperature (ECT) gauge, the instrument cluster is faulty and must be replaced.

If no Engine Coolant Temperature (ECT) is indicated on the VAG1551 scan tool display, the signal must be checked at multi-function connection at instrument cluster.

- Remove instrument cluster ⇒ [Page 90-27](#) .

- Connect VAG1598 tester with VAG1598/25 adapter to the blue 32-pin connector.

- Measure resistance (sensor resistance) between terminal 8 and 7 using VAG1526 multimeter.

Specified values:

Coolant temperature 90 ° C: approx. 110 Ohm

Coolant temperature 120 ° C: approx. 50 Ohm

If the specified values are not reached, the wire connection to Engine Coolant Temperature (ECT) -G2- must be checked.

- Check wire connection according to wiring diagram.

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

If the wire connection is OK, Engine Coolant Temperature (ECT) -G2- must be replaced.

Consumption signal, checking

Special tools and equipment

- ◆ VAG1526 multimeter
- ◆ VAG1598 test box with VAG1598/25 adapter
- ◆ VAG1594 connector test kit
- ◆ Test box for the individual Engine Control Module (ECM)
- Set display indicator of board computer to current consumption (1/100 km),
- Start engine and perform a road test.
- Observe consumption display in instrument cluster.

What appears in the consumption display?

1. constant 0.0 L/100 km

⇒ Possible short circuit to battery Ground (GND) in the signal wire.

- Switch ignition off.
- Connect corresponding test box to the Engine Control Module (ECM).

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24; additional signals, checking; consumption signal for board computer, checking*

- Remove instrument cluster ⇒ [Page 90-27](#) and disconnect blue 32-pin connector from instrument cluster.
- Connect VAG1598 tester with VAG1598/25 adapter to the blue 32-pin connector.
- Connect (+) adapter lead to VAG1598/25 test box socket 25 using VAG1526 multimeter

- Connect (-) adapter lead to the corresponding test box of Engine Control Module (ECM) and the corresponding consumption signal socket of the Engine Control Module (ECM).

90-46

- Perform a resistance check.

Specification: Display < 2 Ohm

- Connect (+) adapter lead to to the corresponding test box of the Engine Control Module (ECM) using VAG1526 multimeter
- Connect (-) adapter lead to battery Ground (GND).
- Perform a resistance check.

Specification: Display > 9 M Ohm

- If the specified values are reached, the wire connection is OK.

2. constant 51 L/100 km

⇒ Possible open circuit in the signal wire.

- Switch ignition off.
- Connect test box to Engine Control Module (ECM).

⇒ *Repair Manual, Fuel Injection & Ignition, Repair Group 24; additional signals, checking; consumption signal for board computer, checking*

- Remove instrument cluster ⇒ [Page 90-27](#) and disconnect blue 32-pin connector from instrument cluster.
- Connect VAG1598 tester with VAG1598/25 adapter to the blue 32-pin connector.
- Connect (+) adapter lead to VAG1598/25 test box socket 25 using VAG1526 multimeter.
- - Connect (-) adapter lead to the corresponding test box of Engine Control Module (ECM) and the corresponding consumption signal socket of

the Engine Control Module (ECM).

- Perform a resistance check.

Specification: Display < 2 Ohm

- Connect (+) adapter lead to to the corresponding test box of the Engine Control Module (ECM) using VAG1526 multimeter
- Connect (-) adapter lead to battery Ground (GND).
- Perform a resistance check.

Specification: Display > 9 M Ohm

- If the specified values are reached, the wire connection is OK.

3. The consumption display has no logical or fluctuating consumption value.

⇒ The consumption display deviates from the actual fuel consumption.

- Perform adaptation of consumption display ⇒ [Page 01-140](#) .

Radio systems

General information

CAUTION!

Before working on the electrical system:

- ♦ ***Determine the correct coding for the anti-theft radio.***
- ♦ ***Disconnect the battery Ground (GND) strap.***

Note:

After re-connecting the battery, activate the vehicle's electrical equipment (radio, clock, power windows, engine) according to the owner's manual.

Notes:

◆ *A new generation of the radio is being used for model year 1998. The "Delta" radio will be replaced by the "Concert" radio which has On Board Diagnostic (OBD) capability.*

◆ *When addressing customer complaints, it is absolutely necessary to know the functions and the operation of the radio system.*

◆ *For additional information:*

⇒ *Radio operating instructions*

◆ *When retrofitting, repairing or troubleshooting:*

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations*

⇒ *Radio installation instructions*

◆ *Repair Manual "Body Interior" contains detailed*

installation instructions, e.g. removing and installing trim.

- ◆ *All radio systems are equipped with anti-theft coding.*

Retrofitting radio systems

- ◆ The connectors on the factory-installed radio wiring harness are designed for genuine Audi radios.
- ◆ Radios with different types of connectors must be installed using adapter wires.

CAUTION!

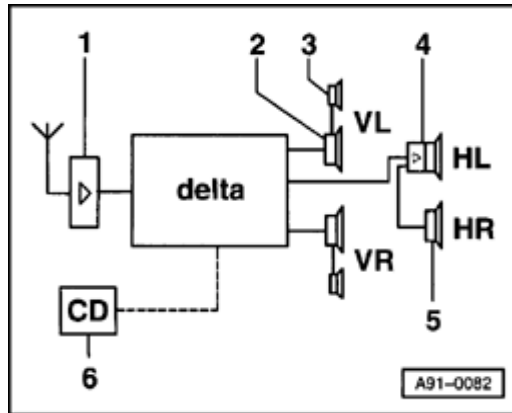
When connecting the vehicle speed sensor signal wire (on radios with the GALA function), take particular care to avoid short circuits, which could result in vehicle malfunctions (e.g. in the engine management system).

- ◆ Vehicle malfunctions may also occur if the vehicle speed sensor signal wire is connected to radios supplied by other manufacturers.
- ◆ If a non-stock radio is installed ("Concert" m.y. 1998 ➤) it can have a negative effect on the antenna amplifier. The original Audi radio units supply power to the antenna amplifier through the center wire of the HF cable.

Retrofitting CD systems

The wiring for the CD changer is installed in the

vehicle during production. The connecting cable can only be used with original Audi CD changers.



Radio system, overview (➤ m.y. 1997)



"Delta" radio system

- 1 - Rear window antenna with antenna amplifier
- 2 - Bass speaker in front door trim (bottom)
- 3 - Mid-range/treble speaker in front door trim (top)
- 4 - Broad-band speaker (active with double amplifier) in parcel shelf (left-rear)
- 5 - Broad band speaker (passive) in parcel shelf (right-rear)
- 6 - CD changer (optional) in luggage compartment (left-rear)

Multi-pin connectors I, II, III (on back of radio), terminal assignments

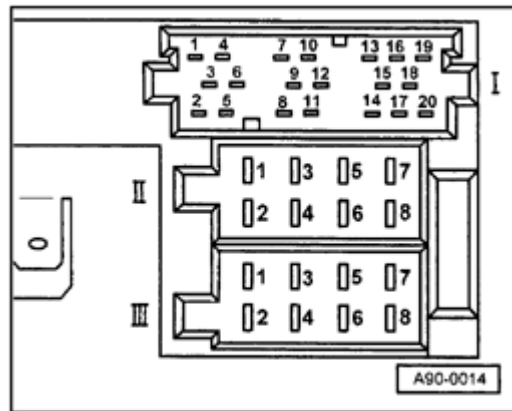
Note:

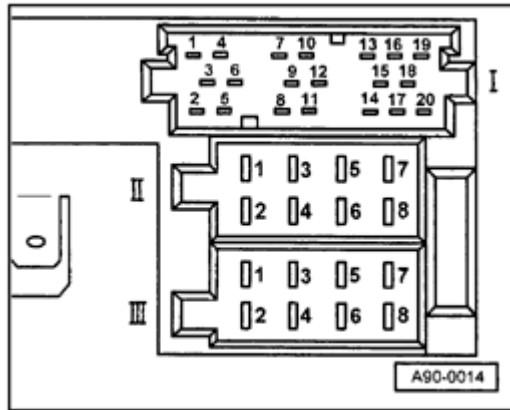
Terminals which are not listed are vacant/unassigned.



20-pin connector I

- 1 - Line out, left-rear
- 2 - Line out, right-rear
- 3 - Low frequency Ground (GND)

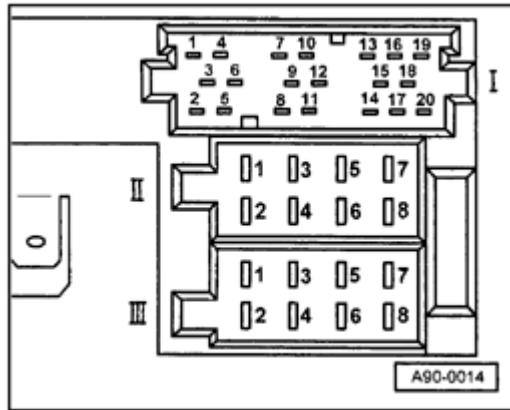




- 6 - Switched positive supply (B+) for active speaker
 8 - Clock signal
 9 - Data signal
 10 - Enable signal
 12 - USA coding
 13 - CD bus data (CD changer)
 14 - CD bus clock (CD changer)
 15 - Ground (GND) for (CD changer)
 16 - Power supply (B+) (continuous)
 17 - Switched positive supply (B+) for CD changer
 18 - Low frequency Ground (GND) for CD changer
 19 - Signal wire for left channel (CD low frequency-L)
 20 - Signal wire for right channel (CD low frequency-R)

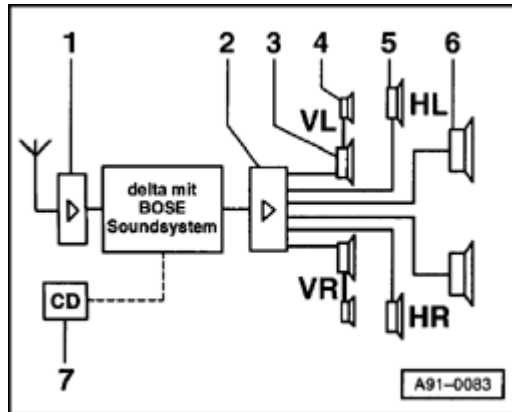
8-pin connector II (brown)

- 3 - Speaker line, right-front (+)
 4 - Speaker line, right-front (-)
 5 - Speaker line, left-front (+)
 6 - Speaker line, left-front (-)



8-pin connector III (black)

- 1 - Vehicle speed sensor (Gala)
- 2 - Low frequency mute switch (telephone system)
- 3 - Terminal 30
- 4 - Terminal 86s connection for ignition key switched on and off (S-contact)
- 5 - Switched positive supply (B+) for antenna amplifier
- 6 - Illumination (terminal 58d)
- 7 - Terminal 30
- 8 - Ground (GND) (terminal 31)



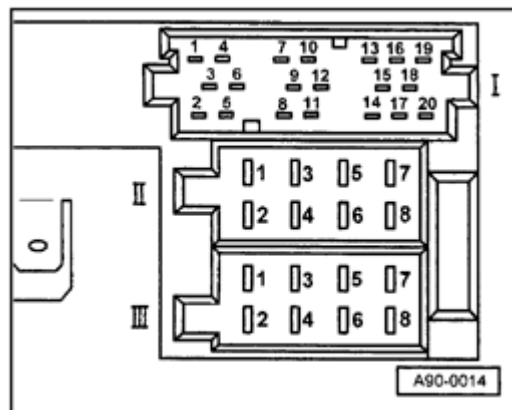
"Delta" radio with BOSE sound system

- 1 - Rear window antenna with antenna amplifier
- 2 - BOSE amplifier in luggage compartment (left-rear)
- 3 - Bass speaker in front door trim (bottom)
- 4 - Mid-range/treble speaker in front door trim (top)
- 5 - Broad band speaker in rear door trim
- 6 - Bass speaker in parcel shelf
- 7 - CD changer (optional) in luggage compartment (left-rear)

Multi-pin connectors I, II, III (on back of radio) terminal assignments

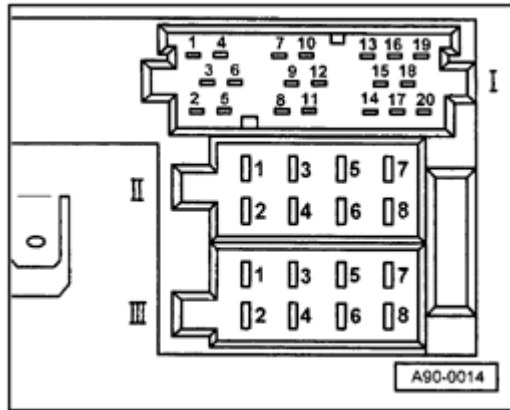
Note:

Terminals which are not listed are vacant/unassigned.



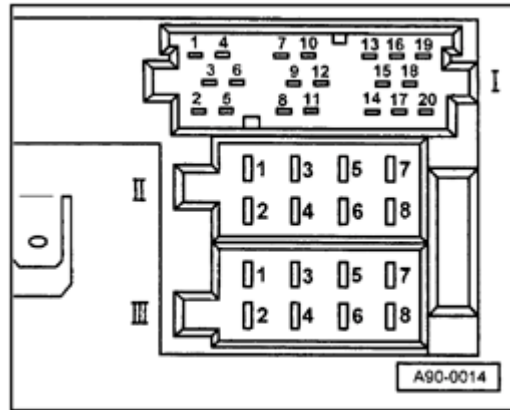
20-pin connector I

- 1 - Line out, left-rear
- 2 - Line out, right-rear
- 3 - Low frequency Ground (GND)



A

- 4 - Line out, left-front
- 5 - Line out, right-front
- 6 - Switched positive supply (B+) for BOSE amplifier
- 7 - BOSE coding
- 8 - Clock signal
- 9 - Data signal
- 10 - Enable signal
- 12 - USA coding
- 13 - CD bus data (CD changer)
- 14 - CD bus clock (CD changer)
- 15 - Ground (GND) (CD changer)
- 16 - Positive supply (B+) (continuous)
- 17 - Switched positive supply (B+) for CD changer
- 18 - Low frequency Ground (GND) for CD changer
- 19 - Signal wire for left channel (CD low frequency-L)
- 20 - Signal wire for right channel (CD low frequency-R)

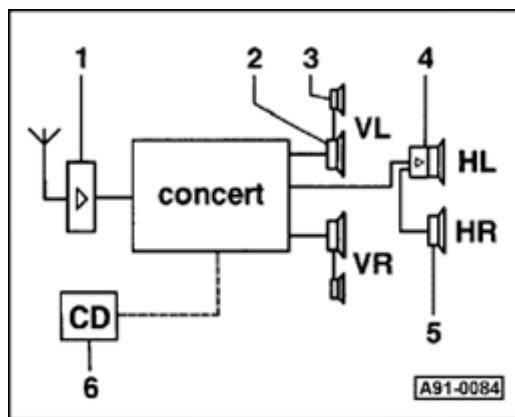


8-pin connector III (black)

- 1 - Vehicle speed sensor (Gala)
- 2 - Low frequency mute switch (telephone system)
- 3 - Terminal 30
- 4 - Terminal 86s connection for ignition key switched on and off (S-contact)
- 5 - Switched positive supply (B+) for antenna amplifier
- 6 - Illumination (terminal 58d)
- 7 - Terminal 30
- 8 - Ground (GND) (terminal 31)

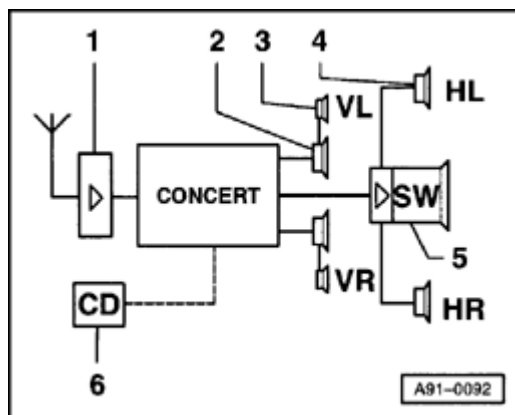
Radio system, overview (m.y. 1998 ➤)

"Concert" radio (sedan)



- 1 - Rear window antenna with antenna amplifier
- 2 - Bass speaker in front door trim (bottom)
- 3 - Mid-range/treble speaker in front door trim (top)
- 4 - Broad band speaker (active with double amplifier) in parcel shelf (left-rear)
- 5 - Broad band speaker (passive) in parcel shelf (right-rear)
- 6 - CD changer (optional) in luggage compartment (left-rear)

"Concert" radio (Avant)



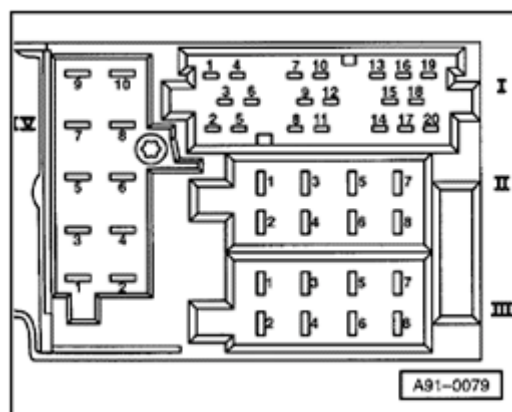
- 1 - Roof antenna with antenna amplifier
- 2 - Bass speaker in front door trim (bottom)
- 3 - Mid-range/treble speaker in front door trim (top)
- 4 - Broad band speaker (2-way) in rear door trim
- 5 - Bass speaker (subwoofer) in left-rear of cargo area under side trim
- 6 - CD changer (optional) in left-rear of cargo area under storage compartment

91-11

Multi-pin connectors I, II, III, IV (on back of radio), terminal assignments

Note:

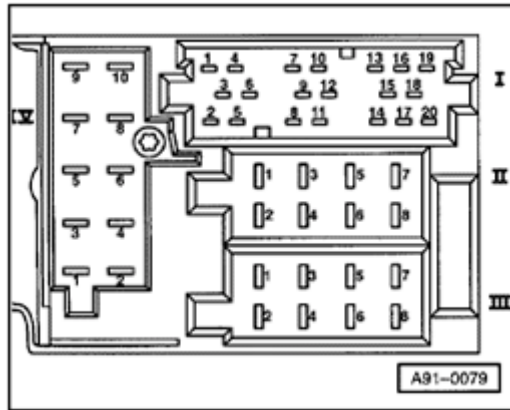
Terminals which are not listed are vacant/unassigned.



20-pin connector I

- 1 - Line out, left-rear
- 2 - Line out, right-rear
- 3 - Low frequency Ground (GND)
- 6 - Switched positive supply (B+) for active speaker (sedan) and/or subwoofer (Avant)
- 8 - Clock signal
- 9 - Data signal
- 10 - Enable signal

91-12



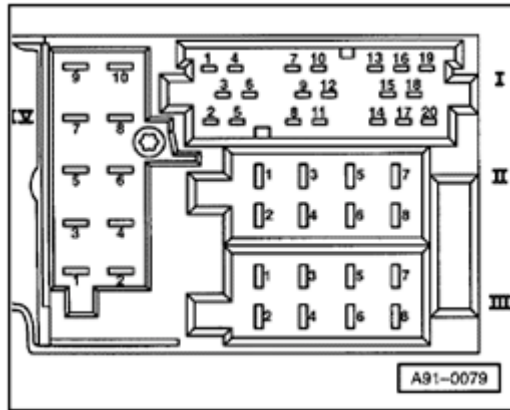
A

- 13 - Bus data in (CD changer)
- 14 - Bus data out (CD changer)
- 15 - Clock (CD changer)
- 16 - Continuous positive supply (B+)
- 17 - Switched positive supply (B+) (CD changer)
- 18 - Low frequency-Ground (GND) (CD changer)
- 19 - Signal wire for left channel (CD low frequency-L)
- 20 - Signal wire for right channel (CD low frequency-R)

8-pin connector II (brown)

- 3 - Speaker line, right-front (+)
- 4 - Speaker line, right-front (-)
- 5 - Speaker line, left-front (+)
- 6 - Speaker line, left-front (-)

91-13



8-pin connector III (black)

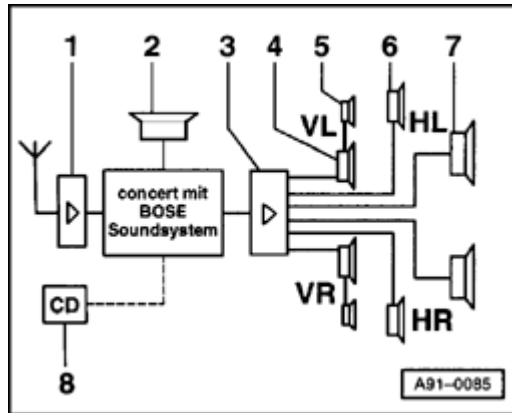
- 1 - Vehicle speed sensor (Gala)
- 3 - K-diagnosis
- 4 - Terminal 86s connection for ignition key switched on and off (S-contact)
- 6 - Illumination (terminal 58d)
- 7 - Terminal 30
- 8 - Ground (GND) (terminal 31)

10-pin connector IV (red)

- 1 - Telephone low frequency mute switch
- 3 - Telephone (low frequency +)
- 4 - Telephone (low frequency -)
- 5 - Navigation (low frequency +) (not applicable US/Canada)
- 6 - Navigation (low frequency -) (not applicable US/Canada)
- 7 - Navigation control line not (not applicable US/Canada)
- 9 - Display illumination (terminal 58d)
- 10 - CD Ground (GND)

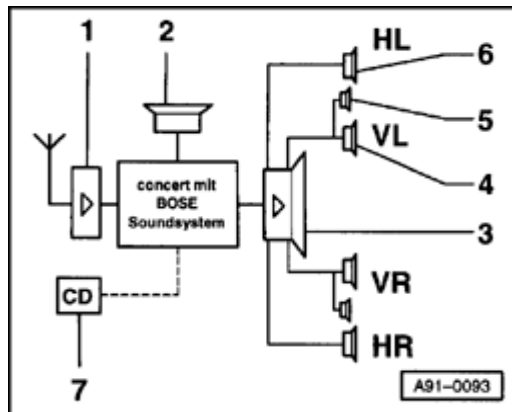
91-14

"Concert" radio with BOSE sound system (sedan)



- 1 - Rear window antenna with antenna amplifier
- 2 - Telephone speaker
- 3 - BOSE amplifier in luggage compartment (left-rear)
- 4 - Bass speaker in front door trim (bottom)
- 5 - Mid-range/treble speaker in front door trim (top)
- 6 - Broad band speaker in rear door trim
- 7 - Bass speaker in parcel shelf
- 8 - CD changer (optional) in luggage compartment (left-rear)

"Concert" radio with BOSE sound system (Avant)

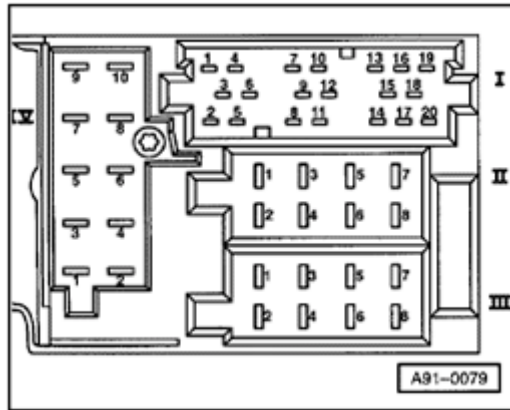


- 1 - Roof antenna with antenna amplifier
- 2 - Telephone speaker
- 3 - BOSE amplifier combined with bass speaker (subwoofer) in cargo area (left-rear) under side trim
- 4 - Bass speaker in front door trim (bottom)
- 5 - Mid-range/treble speaker in front door trim (top)
- 6 - Broad band speaker in rear door trim
- 7 - CD changer (optional) in cargo area (left-rear) under storage compartment

Multi-pin connectors I, II, III, IV (on back of radio), terminal assignments

Note:

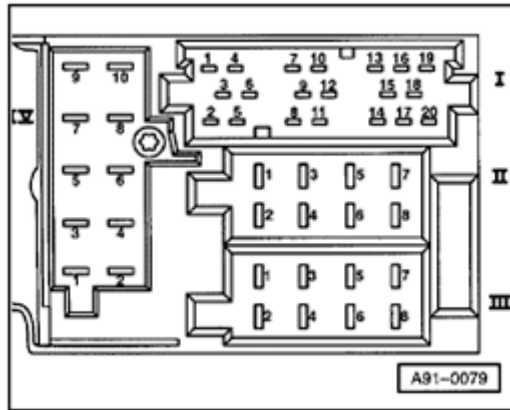
Terminals which are not listed are vacant/unassigned.



20-pin connector I

- 1 - Line out, left-rear
- 2 - Line out, right-rear
- 3 - Low frequency Ground (GND)
- 4 - Line out, left-front
- 5 - Line out, right-front
- 6 - Switched positive supply (B+) for BOSE amplifier

91-16



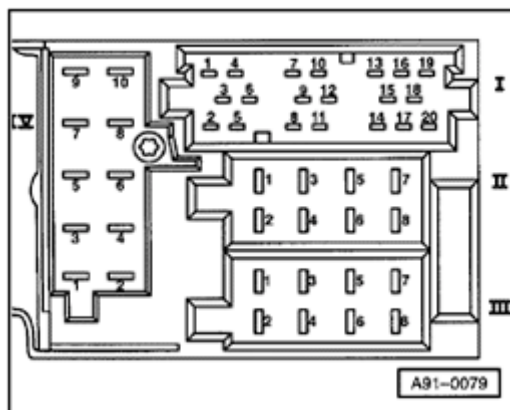
A

- 8 - Clock signal
- 9 - Data signal
- 10 - Enable signal
- 13 - Bus data in (CD changer)
- 14 - Bus data out (CD changer)
- 15 - Clock (CD changer)
- 16 - Continuous positive supply (B+)
- 17 - Switched positive supply (B+) (CD changer)
- 18 - Low frequency-Ground (GND) (CD changer)
- 19 - Signal wire left channel (CD low frequency-L)
- 20 - Signal wire right channel (CD low frequency-R)

8-pin connector II (brown)

- 5 - Hands-free speaker (+)
- 6 - Hands-free speaker (-)

91-17

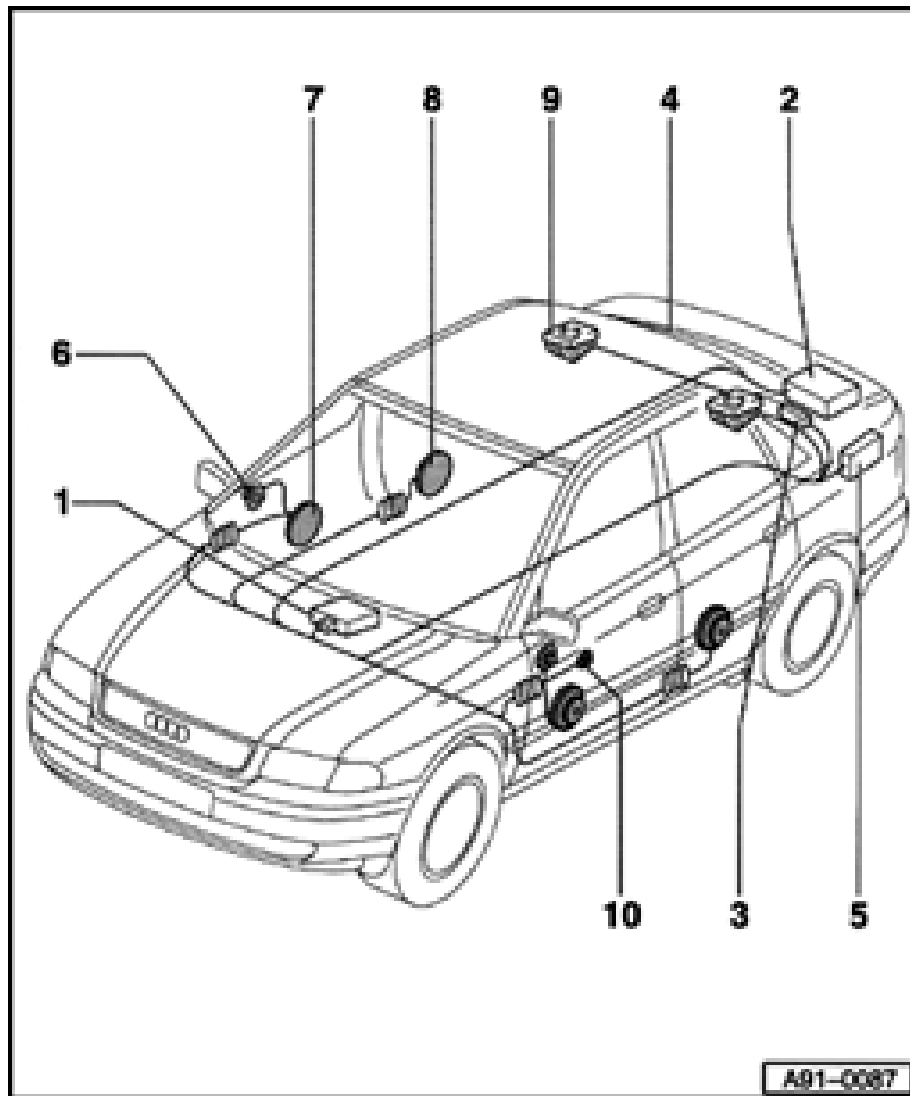


8-pin connector III (black)

- 1 - Vehicle speed sensor (Gala)
- 3 - K-Diagnosis
- 4 - Terminal 86s connection for ignition key switched on and off (S-contact)
- 6 - Illumination (terminal 58d)
- 7 - Terminal 30
- 8 - Ground (GND) (terminal 31)

10-pin connector IV (red)

- 1 - Telephone mute switch
- 3 - Telephone (low frequency +)
- 4 - Telephone (low frequency -)
- 5 - Navigation (low frequency +) (not applicable US/Canada)
- 6 - Navigation (low frequency -) (not applicable US/Canada)
- 7 - Navigation control line not (not applicable US/Canada)
- 9 - Display illumination (terminal 58d)
- 10 - CD Ground (GND)



Radio system, overview (sedan)

1 - Radio

- ◆ In center console
- ◆ Removing and installing ⇒ [page 91-23](#)

2 - BOSE amplifier

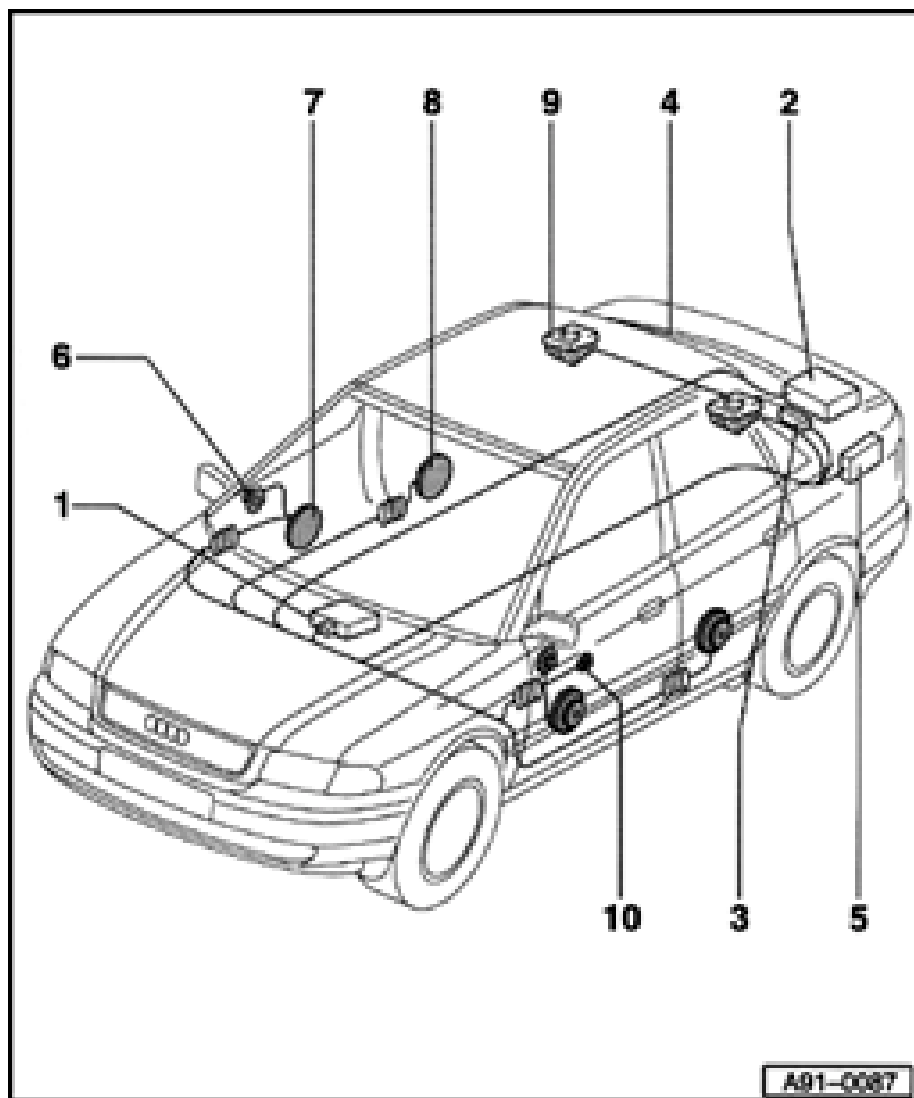
- ◆ In luggage compartment (left-rear) under parcel shelf
- ◆ Removing and installing ⇒ [page 91-35](#)

3 - Antenna amplifier

- ◆ In left D-pillar trim
- ◆ Removing and installing ⇒ [page 91-39](#)

4 - Rear window antenna

- ◆ Upper 3 wires are AM antenna (non-heated)
- ◆ Remaining wires are FM antenna (heated)
- ◆ Removing and installing ⇒ [Repair Manual, Body Exterior, Repair Group 64](#)

**5 - CD changer**

- ◆ In luggage compartment (lower-left)
- ◆ Removing and installing ⇒ [page 91-31](#)
- ◆ Checking cable ⇒ [page 91-34](#)

6 - Mid-range/treble speaker

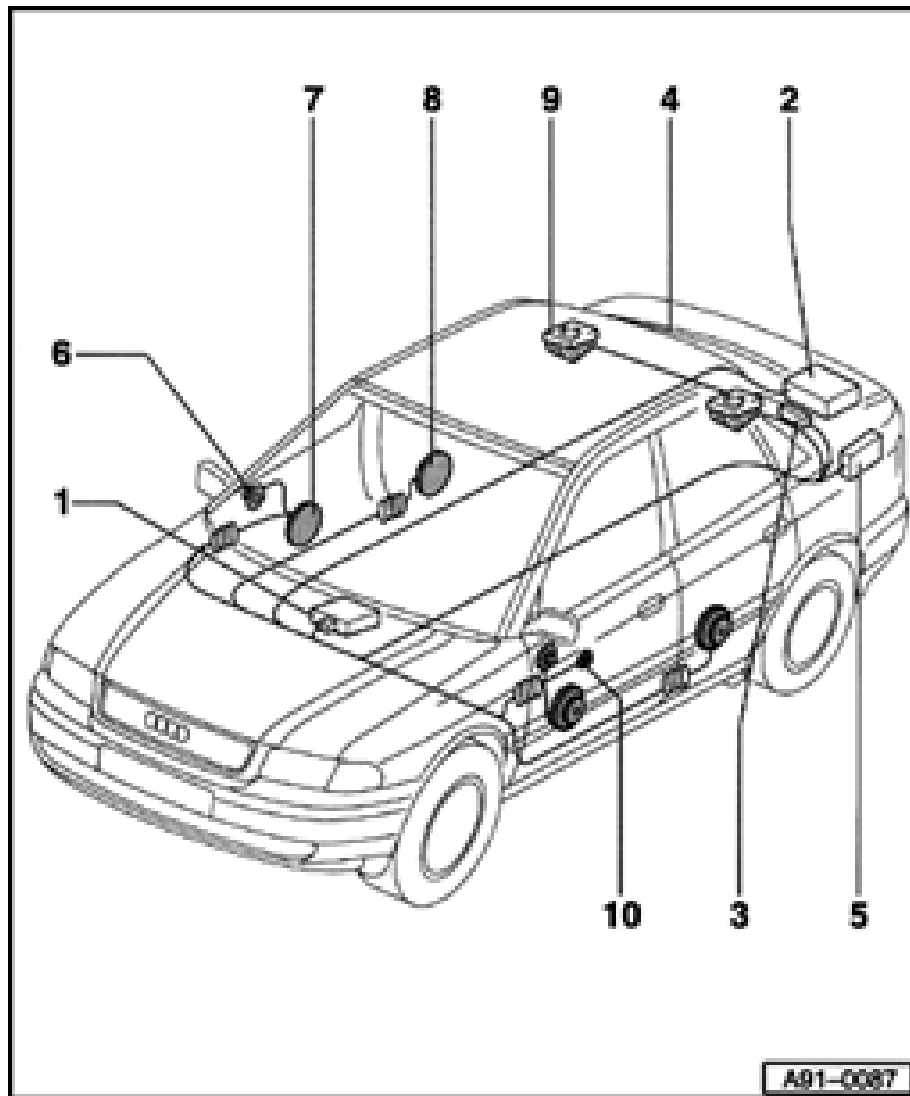
- ◆ In front door trim (top)
- ◆ Removing and installing ⇒ [page 91-28](#)

7 - Bass speaker

- ◆ In front door trim (bottom)
- ◆ Removing and installing ⇒ [page 91-27](#)

8 - Broad band speaker

- ◆ In rear door trim (only with BOSE sound system)
- ◆ Removing and installing ⇒ [page 91-30](#)

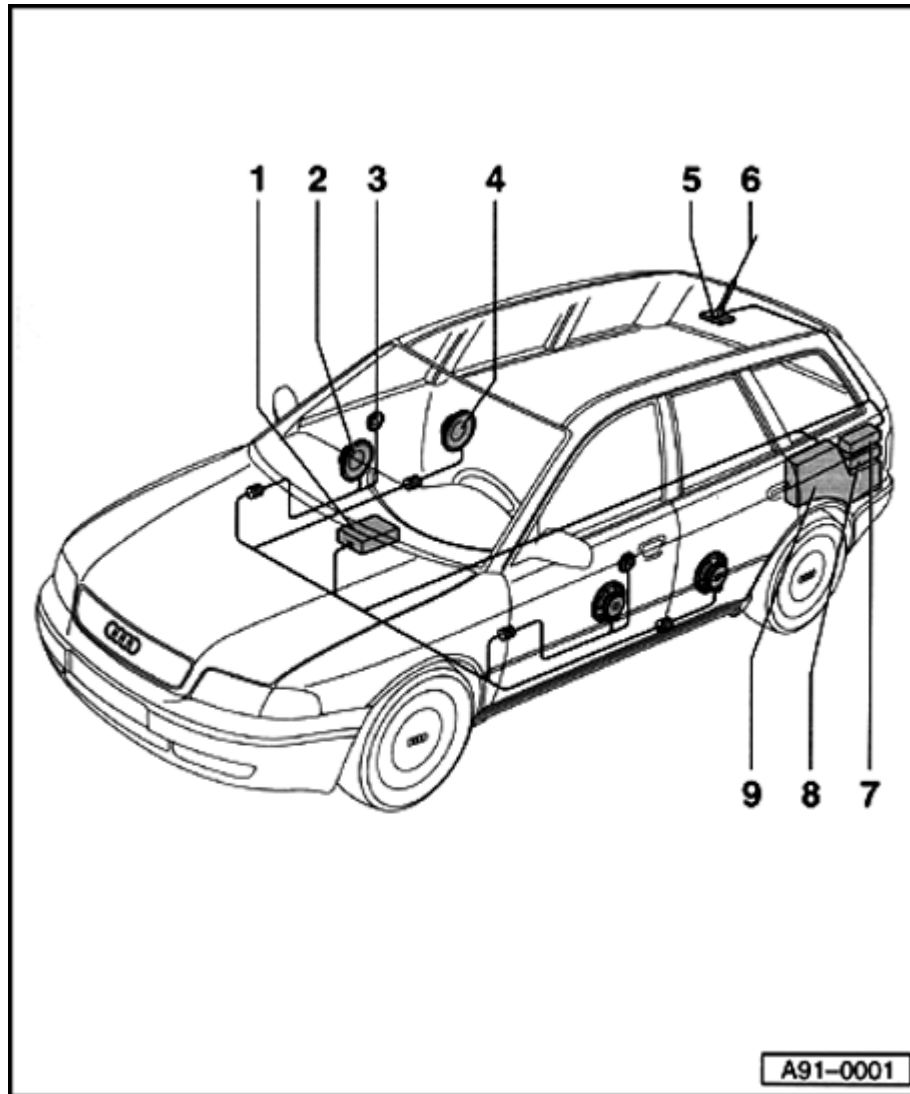


9 - Speaker in parcel shelf

- ◆ Broad band speaker
- ◆ Removing and installing ⇒ [page 91-29](#)
- ◆ Bass speaker (only with BOSE sound system)
- ◆ Removing and installing ⇒ [page 91-29](#)

10 - Telephone speaker

- ◆ With standard radio equipment, speakers in front door trim are also used as telephone speakers
- ◆ For radios with BOSE sound system, telephone speaker is in front door trim on driver's side



Radio system, overview (Avant)

1 - Radio

- ◆ In center console
- ◆ Removing and installing ⇒ [page 91-23](#)

2 - Bass speaker

- ◆ In front door trim (bottom)
- ◆ Removing and installing ⇒ [page 91-27](#)

3 - Mid-range/treble speaker

- ◆ In front door trim (top)
- ◆ Removing and installing ⇒ [page 91-28](#)

4 - Broad band speaker

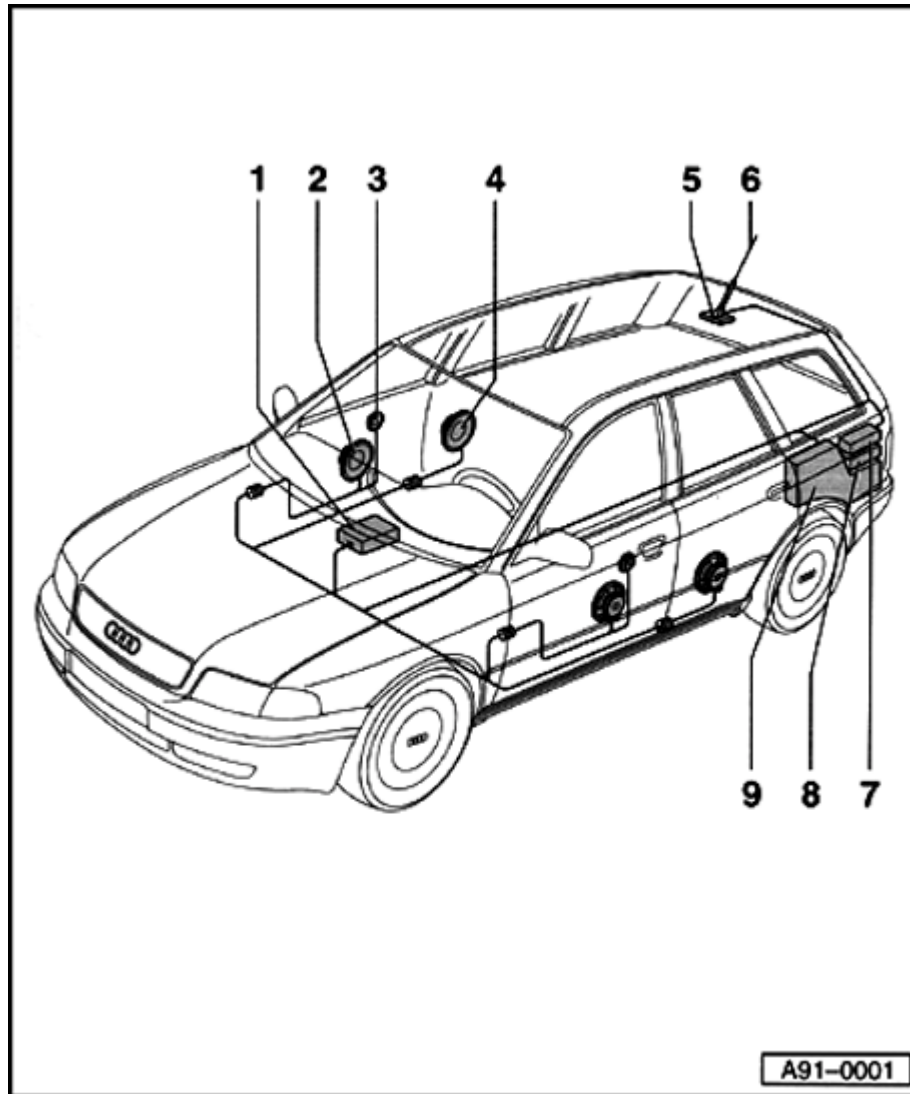
- ◆ In rear door trim
- ◆ Removing and installing ⇒ [page 91-30](#)

5 - Antenna base

- ◆ With integrated amplifier

6 - Roof antenna

- ◆ With radio and telephone system, combination antenna is used
- ◆ Removing and installing ⇒ [page 91-40](#)



7 - CD changer

- ◆ In luggage compartment (left-rear) under cargo area storage bin
- ◆ Removing and installing ⇒ [page 91-32](#)
- ◆ Checking cable between radio and CD changer ⇒ [page 91-34](#)

8 - BOSE amplifier combined with bass speaker (subwoofer) only with "Concert with BOSE sound system"

- ◆ In cargo area (left-rear) under side trim
- ◆ Removing and installing ⇒ [page 91-37](#)

9 - Bass speaker (subwoofer) only with "Concert" radio

- ◆ In cargo area (left-rear) under side trim
- ◆ Removing and installing ⇒ [page 91-37](#)

Radio, removing and installing (Concert)

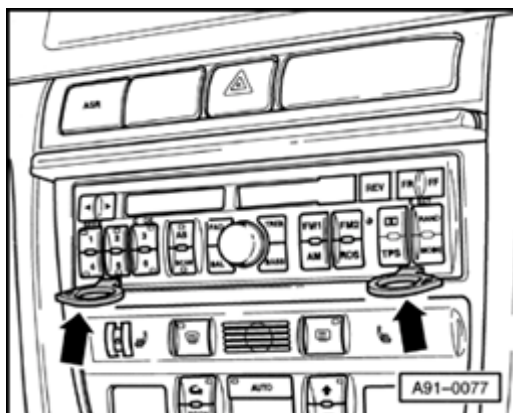
CAUTION!

Obtain the anti-theft radio code before disconnecting the radio.

Special tools and equipment

T10057 radio removal tool

Removing



- Insert T10057 radio removal tool into front panel of radio as shown.
 - ◆ Top L: upper left
 - ◆ Top R: upper right
- Remove radio out of instrument panel together with T10057.
- Disconnect harness connectors and antenna wire.

Installing

- Remove T10057 radio removal tool before installing radio.
- Connect harness connectors and antenna wire.
- Carefully slide radio into instrument panel until radio is fully engaged in frame.
- Enter anti-theft radio code and check operation
⇒ radio owners manual.

Radio, removing and installing (Symphony)

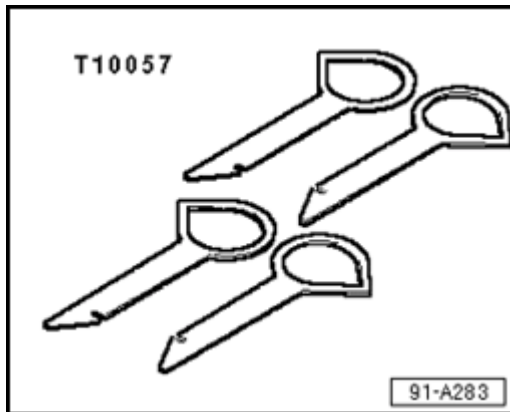
CAUTION!

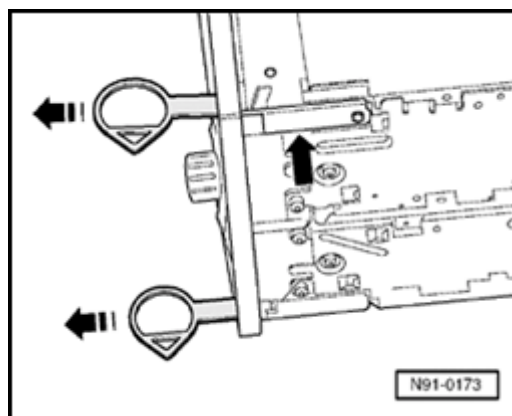
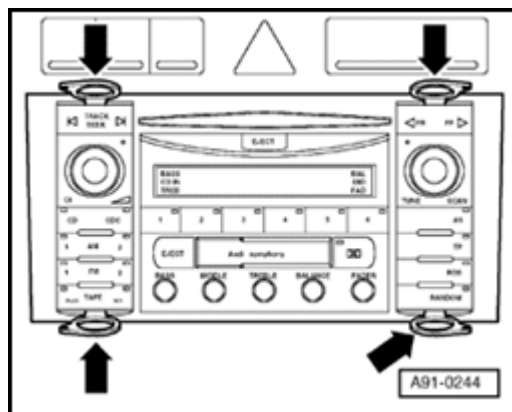
**Obtain the anti-theft radio code before
disconnecting the radio.**



Required special tools and equipment

- ◆ T10057 radio removal tool





Removing

Perform the following work sequence:

- - Insert T10057 radio removal tools into release slots (arrows) as shown until they engage.
 - ◆ Top L - top and bottom left
 - ◆ Top R - top and bottom right
- Pull radio out of instrument panel using grip rings on release tool.
- Unlock and disconnect harness connectors

Remove radio release tools:

- - Press locking latch arrow- and remove radio release tools toward front.

Installing

- Connect harness connectors to radio.
- Slide radio evenly into instrument panel, until it engages in assembly frame.

Speakers, removing and installing

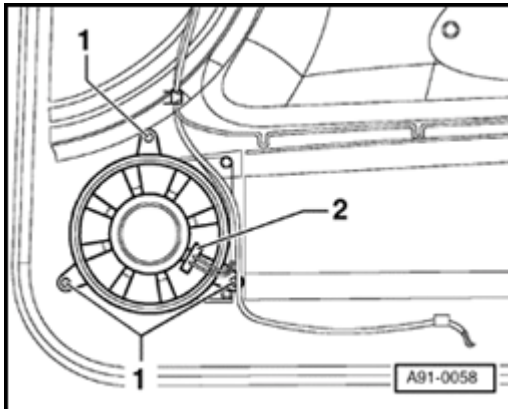
Removing and installing bass speakers in front door trim

Removing

Remove front door trim.

⇒ [Repair Manual, Body Interior, Repair Group 70](#).

Carefully loosen insulation in area of bass speaker on back side of door trim.



A

- Disconnect harness connector -2- from speaker.
- Remove screws -1- on speaker and remove speaker from door trim.

Installing

- Install in reverse order of removal.

Removing and installing mid-range/treble speakers in front door trim

Removing

Remove front door trim.

⇒ [Repair Manual, Body Interior, Repair Group 70](#).

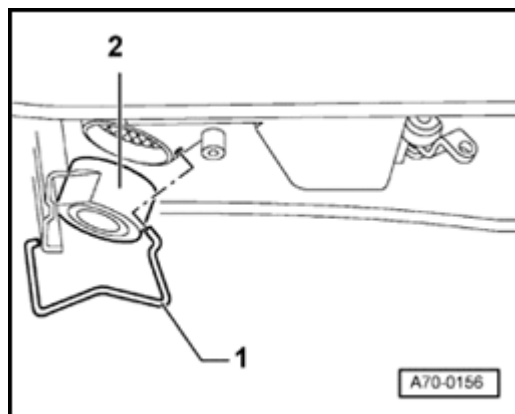
- Carefully loosen insulation in area of treble speaker on back side of door trim.



- Using screwdriver, disconnect clip -1-.
- Remove speaker -2- from door trim.

Installing

- Install in reverse order of removal.



Removing and installing speakers in parcel shelf

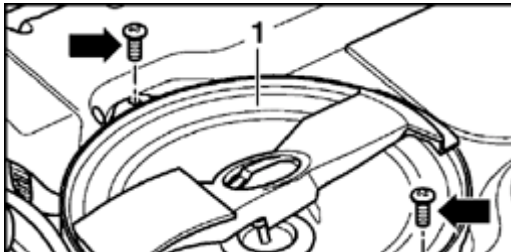
Notes:

- ◆ Broad band speakers are installed in the parcel shelf for ➤ m.y. 1997 vehicles with the "Delta" radio and ➤ m.y. 1998 vehicles with the "Concert" radio.
- ◆ Bass speakers are installed in the parcel shelf for ➤ m.y. 1997 with the "Delta" radio with the BOSE sound system and/or m.y. 1998 ➤ vehicles with the "Concert" radio with the BOSE sound system.

Removing

Remove parcel shelf.

⇒ [Repair Manual, Body Interior, Repair Group 70](#).



A

- Remove two mounting screws (arrows) from broad band speaker and/or treble speaker -1- and remove speaker upward out of sheet metal cut-out under parcel shelf.
- Disconnect harness connector.

Installing

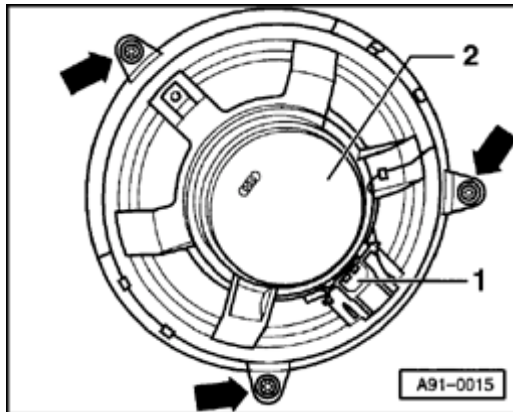
- Install in reverse order of removal.

Removing and installing broad band speakers in rear door trim

Removing

Remove rear door trim.

⇒ [Repair Manual, Body Interior, Repair Group 70](#).



A

- Carefully loosen insulation from door trim in area of broad band speaker on back of door trim.
- Disconnect harness connector -1-.
- Remove mounting screws (arrows) from broad band speaker -2- and remove speaker from door trim.

Installing

- Install in reverse order of removal.

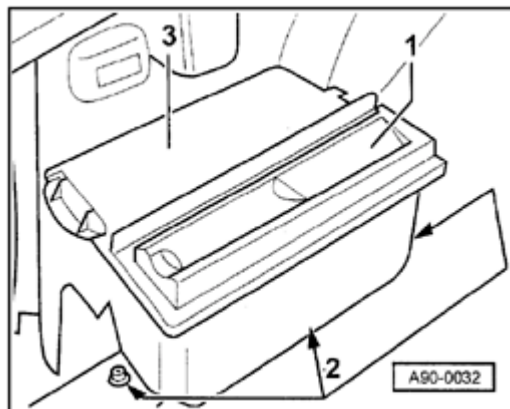
CD changer, removing and installing (sedan)

Removing

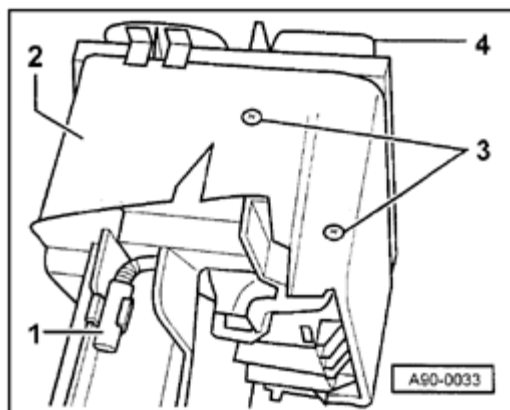
The CD changer is located in the luggage compartment on the left side wall in a holding box. A compartment with the on board tool kit is also integrated here.

- ⚠ The CD changer -1- is located in a holding box -3- in the left side of the luggage compartment behind the wheel housing.

- Remove three Phillips-head screws -2- and remove holding box -3-.



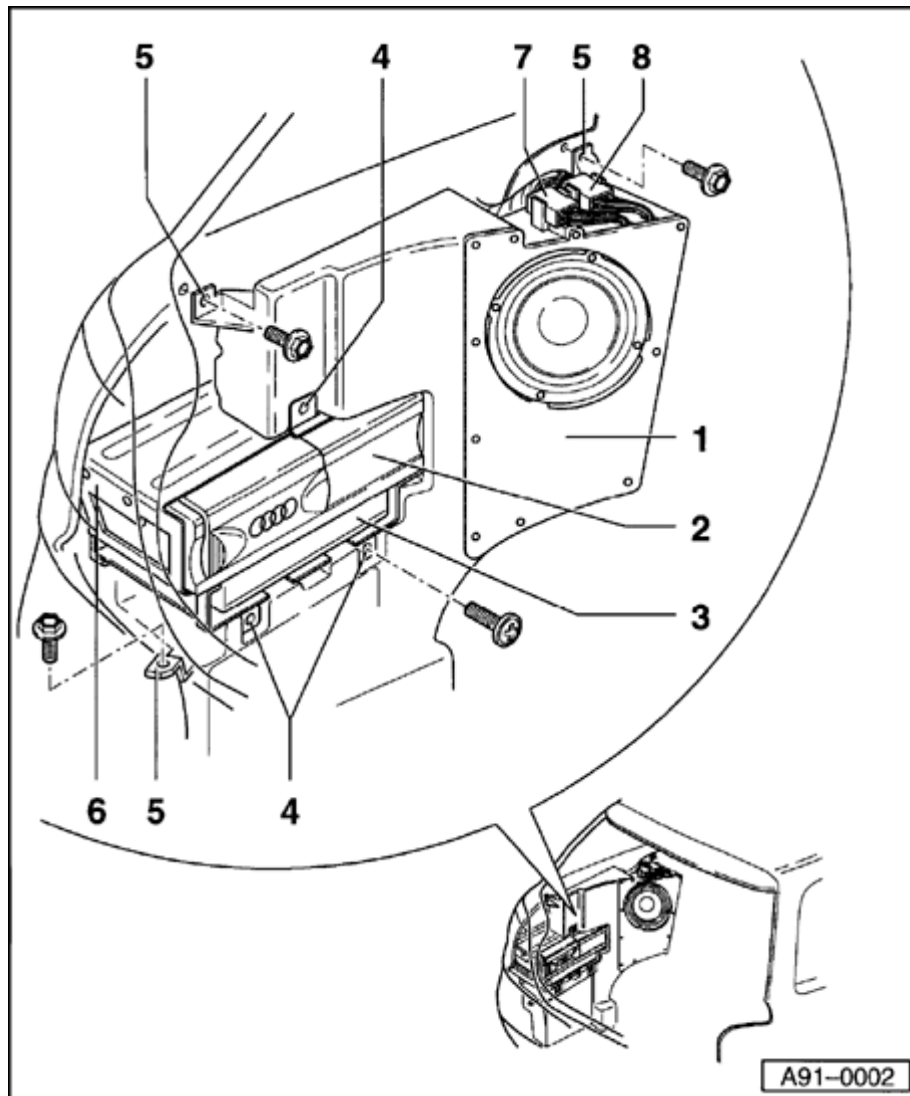
- ⚠
- Disconnect harness connector -1- under holding box -2- and remove holding box from luggage compartment.
 - Remove four Phillips-head screws -3- on both sides of holding box -2- and remove CD changer from holding box.



Installing

- Install in reverse order of removal.

- After installing CD changer, cable between radio and CD changer must be checked ⇒ [page 91-34](#) .



CD changer, removing and installing (Avant)

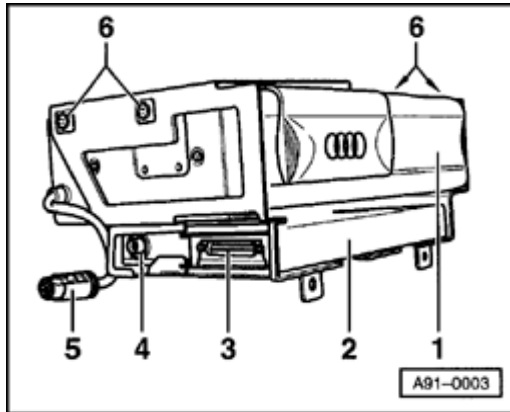
Overview

- 1 - Bass speaker (subwoofer)
- 2 - CD changer
- 3 - Telephone sending/receiving unit (not applicable for USA/Canada)
- 4 - Phillips-head screws (3x)
 - ◆ For mounting frame for CD/telephone
- 5 - Mounting screws for bass speaker (subwoofer)
- 6 - Frame for CD changer/telephone
- 7 - Harness connector for BOSE amplifier
- 8 - Harness connector for bass speaker (subwoofer)

Removing

The CD changer is in the left rear of the cargo area under the storage bin.

- Open left side cargo area storage bin.
- Remove mounting screws and remove frame from storage bin.
- Disconnect harness connector -5- on CD changer -1-.
- Disconnect harness connector -3-.
- To remove CD changer, remove from side four Phillips-head screws -6- and remove CD changer from frame.



Installing

- Install in reverse order of removal.
- After installing CD changer, cable between radio and CD changer must be checked ⇒ [page 91-34](#) .

Checking cable between radio and CD changer

- Switch radio off.
- Press MODE button on radio while turning radio on.

Do not press the MODE button again.

If the cable connection is OK:

The radio display indicates: "CONNECT" and "CD"

If the cable connection is NOT OK:

The radio display indicates: "NO CDC"

- Check electrical connections on CD changer.
- Repeat check as described above.

If not OK:

- Check wiring connections ⇒ Electrical Wiring Diagrams Troubleshooting & Component Locations

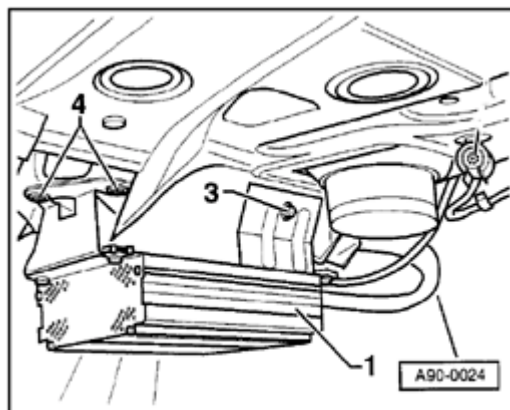
BOSE amplifier, removing and installing (sedan)

Note:

In vehicles from VIN 200000, the Bose amplifier is mounted in the same area as shown below, but in a vertical orientation.

Removing

The BOSE amplifier is located in the luggage compartment on the left side over the wheel housing.



A

- Remove Phillips-head screws -3- (1x) and -4- (2x) and remove frame for BOSE amplifier -1-.
- Disconnect harness connector on back of amplifier.

Installing

- Install in reverse order of removal.

BOSE amplifier with bass speaker (subwoofer), removing and installing (Avant)

The BOSE amplifier is located in the left side of the cargo area under the cargo area side trim.

Notes:

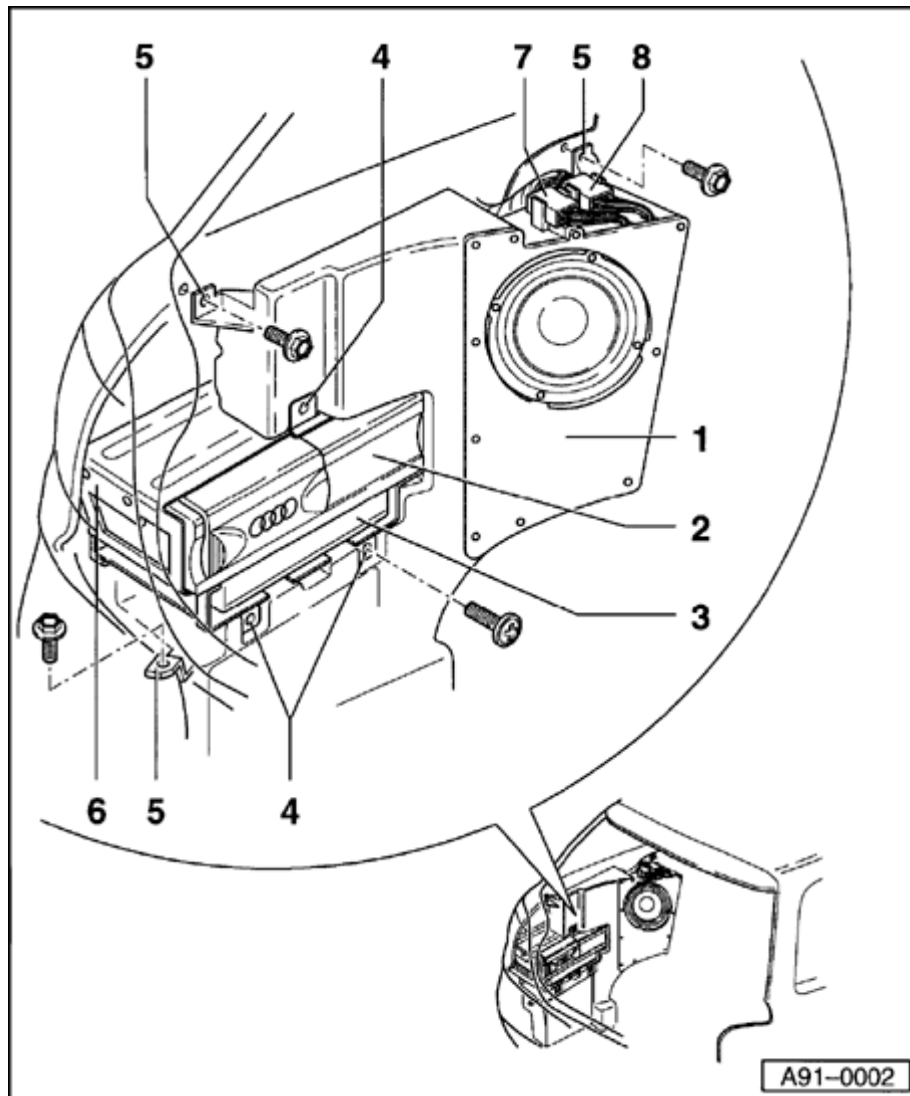
- ◆ *If the vehicle is equipped with a CD changer, it must be removed ⇒ [page 91-32](#) .*
- ◆ *Bass speaker (subwoofer), removing and installing ⇒ [page 91-37](#) .*

Bass speaker (subwoofer), removing and installing (Avant)

Note:

If the vehicle is equipped with a CD changer, it must be removed ⇒ [page 91-32](#) .

The bass speaker (subwoofer) is located on the left side of the cargo area under the cargo area side trim.



Removing

- Open storage bin at left side of cargo area.
- Remove left side cargo area side trim ⇒ [Repair Manual, Body Interior, Repair Group 70](#) .
- Disconnect harness connector -8- for bass speaker (if equipped with BOSE sound system, also disconnect harness connector -7-).
- Remove bass speaker (subwoofer) from side part -1-.

Installing

- Install in reverse order of removal.

Antenna amplifier, removing and installing (sedan)

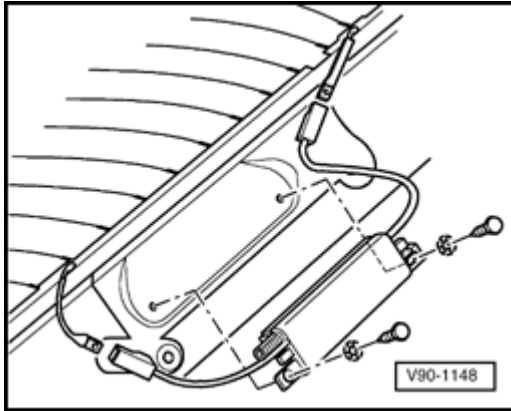
Removing

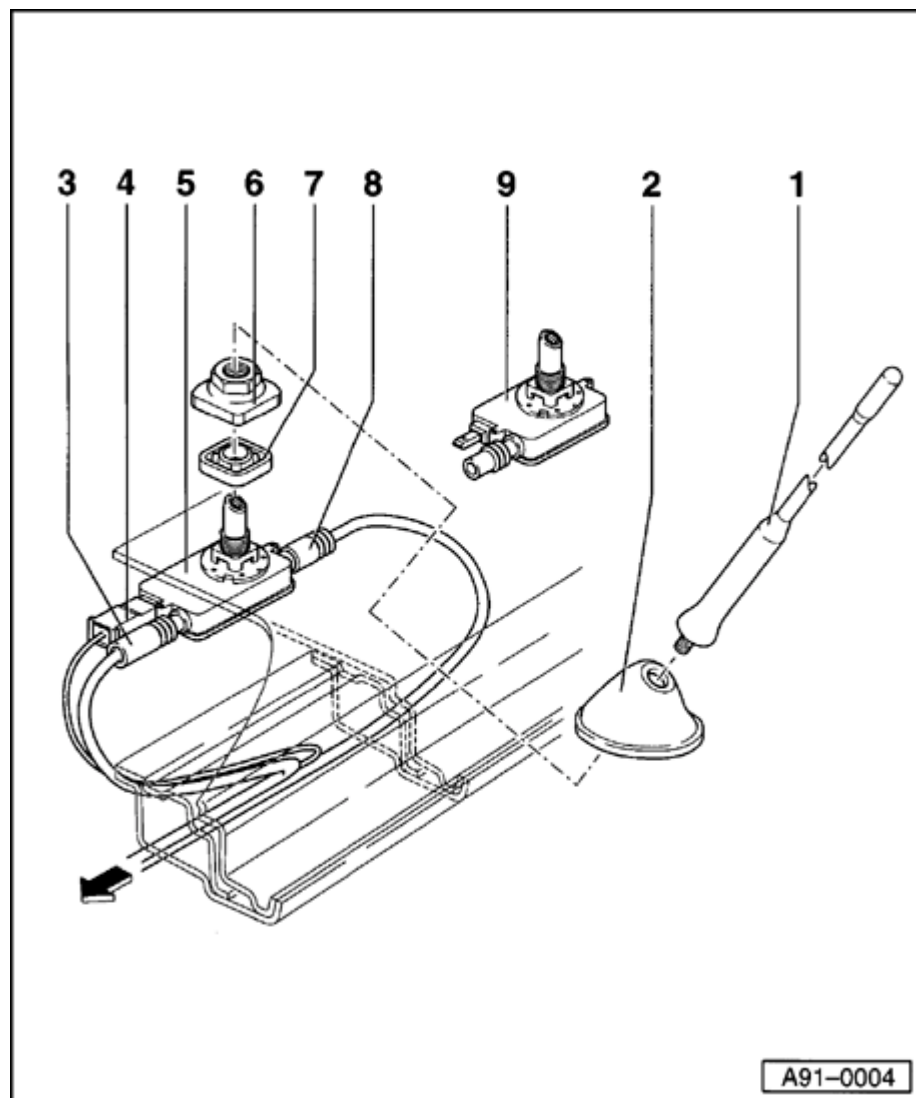


- Remove D-pillar trim ⇒ [Repair Manual, Body Interior, Repair Group 70](#).
- Disconnect antenna wire and disconnect all harness connectors.
- Remove hex screws and remove antenna amplifier.

Installing

- Install in reverse order of removal.



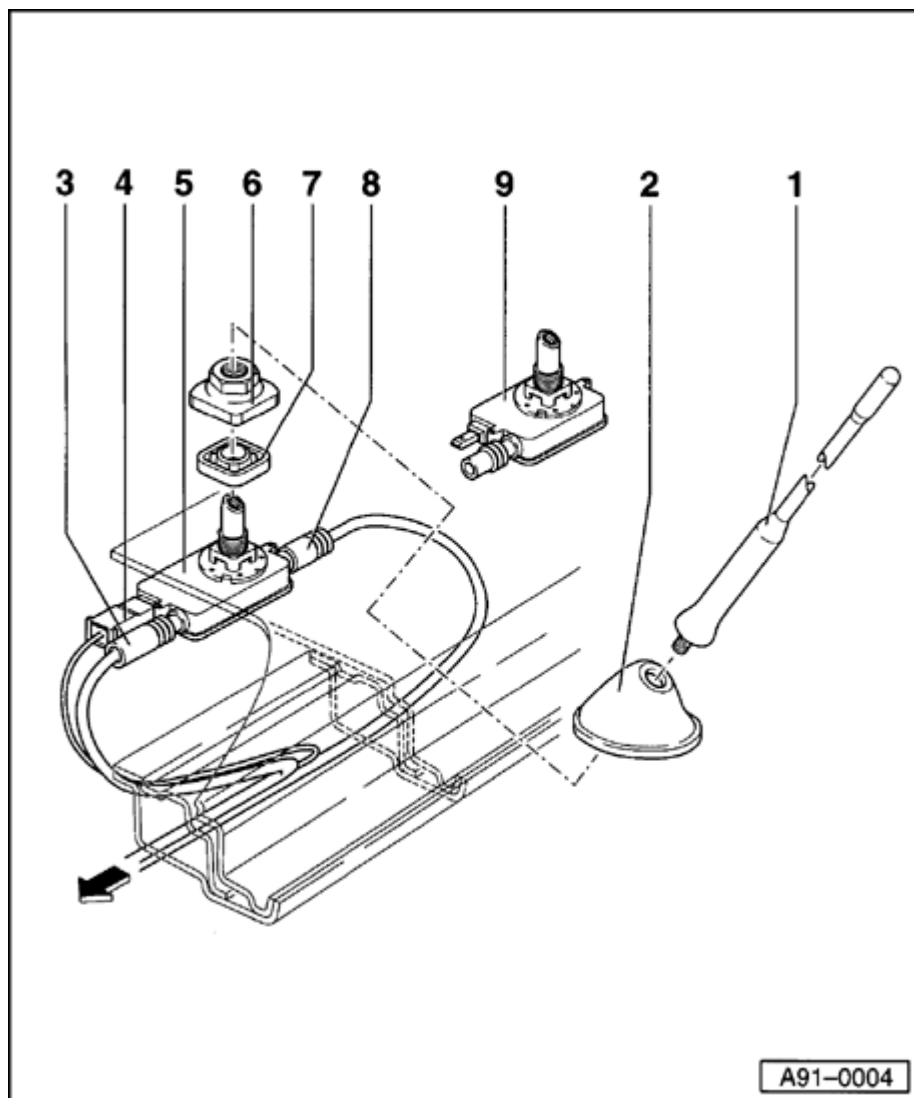


Roof antenna, removing and installing (Avant)

Overview

- 1 - Antenna
- 2 - Antenna base cover
- 3 - Harness connector for radio antenna wire
- 4 - Harness connector for switched positive supply (B+) (➤ m.y. 1997 only)
- 5 - Antenna base for radio/telephone combination antenna
- 6 - Mounting nut
- 7 - Gasket for antenna base
- 8 - Harness connector for telephone wire
- 9 - Antenna base for radio antenna

91-41



Removing

- Using screwdriver, carefully pry cargo area dome light off of headliner.
- Disconnect antenna - 1 -.
- Pull cover - 2 - upward.
- Remove mounting nut - 6 -.
- Remove antenna base - 5 - or - 9 - toward inside of vehicle through headliner opening.
- Disconnect harness connectors - 3 -, - 4 - and if necessary - 8 -. Push back sliding sleeves - 3 - and - 8 - during disassembly.

Installing

- Install in reverse order of removal.

Multi-function steering wheel

CAUTION!

***Before working on the electrical system:
Disconnect the battery Ground (GND) strap.***

Notes:

- ◆ *Obtain radio code before disconnecting battery.*
- ◆ *Be sure to activate vehicle features (radio, clock, electric window regulator, engine) according to owner's manual when the battery is re-connected.*

General description

System includes:

- ◆ Six illuminated function buttons in steering wheel
- ◆ Steering wheel-incorporated wiring
- ◆ Steering wheel-incorporated electronics
- ◆ Vehicle-incorporated control module

◆ Vehicle-incorporated wiring

Function description:

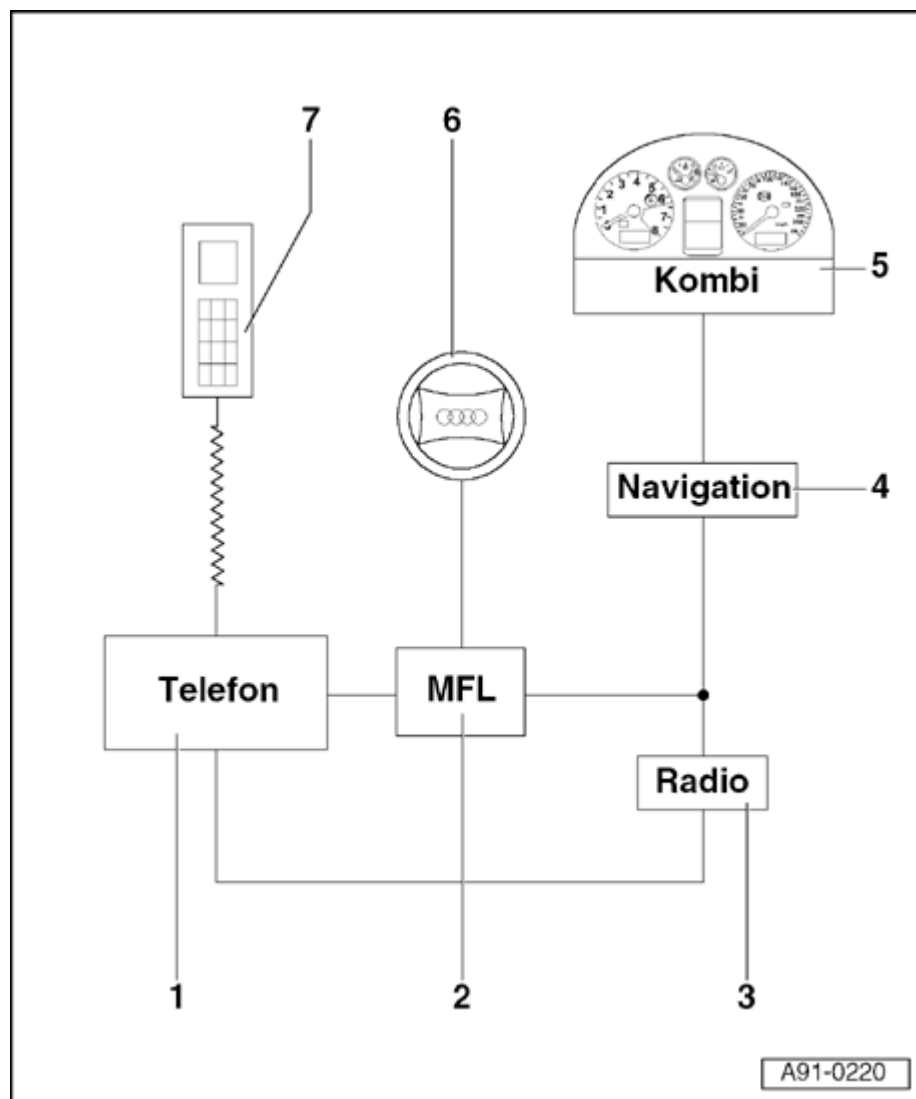
For better operation of radio and telephone system while driving, six function keys are integrated into the steering wheel. In addition, the multi-function steering wheel is electrically heated.

The electronics in the steering wheel take over the regulation of the steering wheel heating, transmission of the six function buttons to CAN-bus and dimming of the function buttons. The electronics in the steering wheel cannot be replaced individually, the entire steering wheel must be replaced in case of a malfunction.

The control module of the multi-function steering wheel takes over control of the radio (or radio/navigation system), telephone system, instrument cluster, and steering wheel heating.

In the center display of the instrument cluster, the selected station appears during radio operation and the name and telephone number of the dialogue partner from the telephone memory appears during telephone operation. If a cassette is inserted during radio operation, the message "TAPE < >" appears and for CD-operation, CD-number "CD 02" and the respective title (track) "TR 09" appears on the center display.

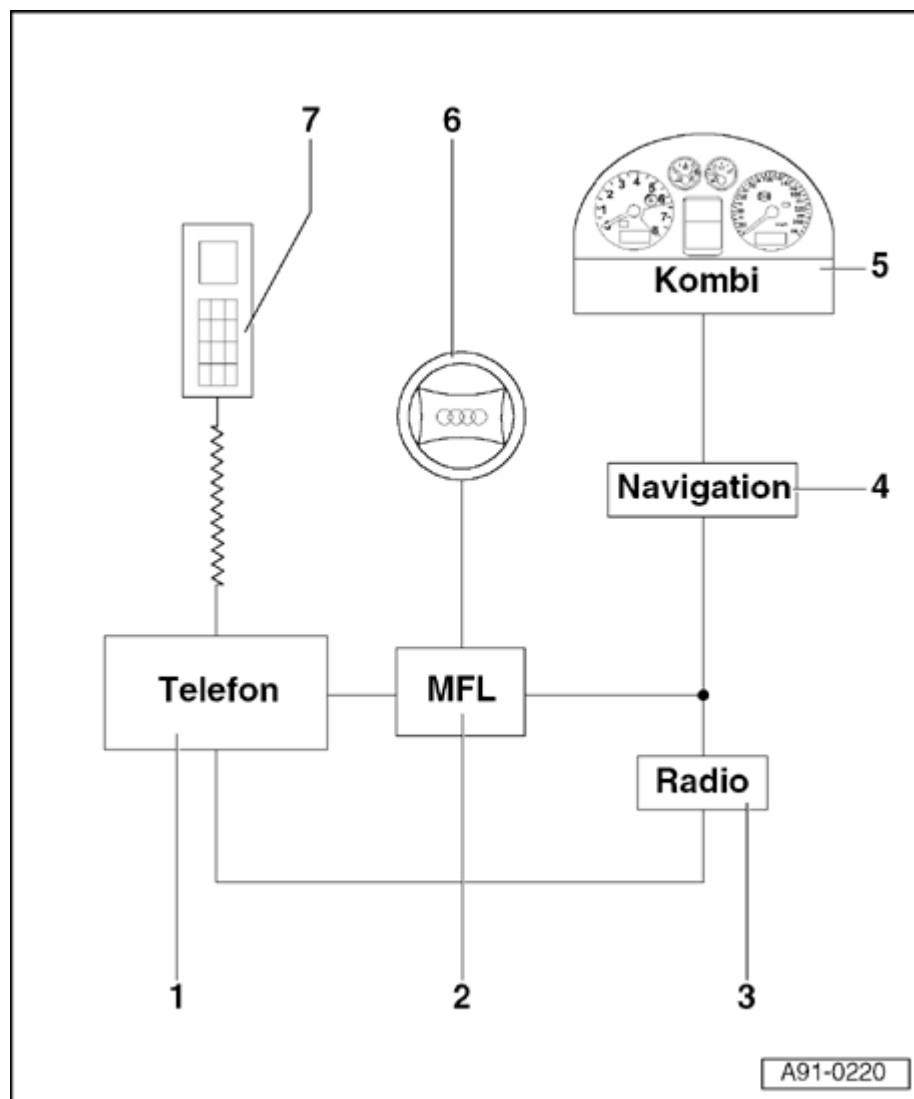
91-71



Multi-function steering wheel, overview

- 1 - Operating electronics and telephone control module -J412- (Handy) or telephone transceiver -R36-**
- 2 - Control module for multi-function steering wheel -J453-**
 - ◆ At 13-pin relay carrier below the driver's side storage compartment
 - ◆ Removing and installing ⇒ [page 91-75](#)
- 3 - Radio**
 - ◆ Installed in center console
- 4 - Control module for operating electronics, navigation -J402-**
 - ◆ Installed in center console
 - ◆ Either a radio system is installed, or a control module for operating electronics and navigation

91-72

**5 - Instrument cluster**

- ◆ Installed in instrument panel

6 - Multi-function steering wheel

- ◆ With integrated operation switches
- ◆ With steering wheel-integrated electronics

7 - Handset for telephone or Handy

Operating switch on multi-function steering wheel, removing and installing

Removing

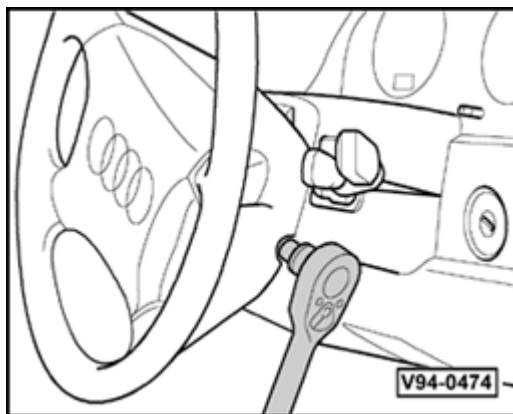
- Disconnect battery ground (GND) strap.

Note:

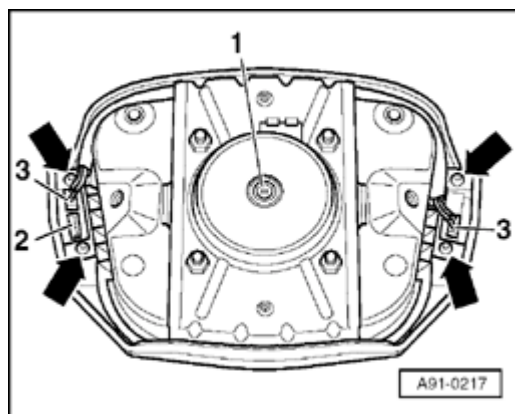
Always observe airbag safety precautions when working on airbag system components

⇒ [Repair Manual, Body Interior, Repair Group 69; airbag safety precautions](#)

- Release steering column adjustment. Pull steering wheel as far out and up as possible.
- A** - Remove airbag unit by removing screws at left and right of steering wheel using a T30 TORX bit. Tightening torque: 6 Nm



91-74



- Carefully flip airbag unit forward.

A

- Disconnect harness connectors -1- and -2- at airbag unit.

- Remove airbag unit.

- Disconnect harness connector -3- and remove both T10 TORX screws at left or right of operating switch.

- Remove operating switch toward front.

Installing

Note:

During installation, make sure that the wires of connector -3- are in the guides and are not pinched.

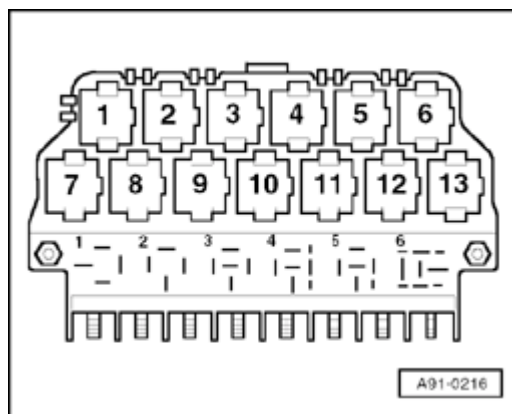
- Install in reverse order of removal.

Control module for multi-function steering wheel -J453-, removing and installing

Removing

- Remove driver's side storage compartment

⇒ [Repair Manual, Body Interior, Repair Group 68; storage bin on driver's side, removing](#)



Control module for multi-function steering wheel -J453 is housed in a double-relay box and located in positions -2- and -3- of the 13-pin relay carrier via the central electronics

- Remove control module for multi-function steering wheel from relay socket.

Installing

- Install in reverse order of removal.

Headlights, servicing

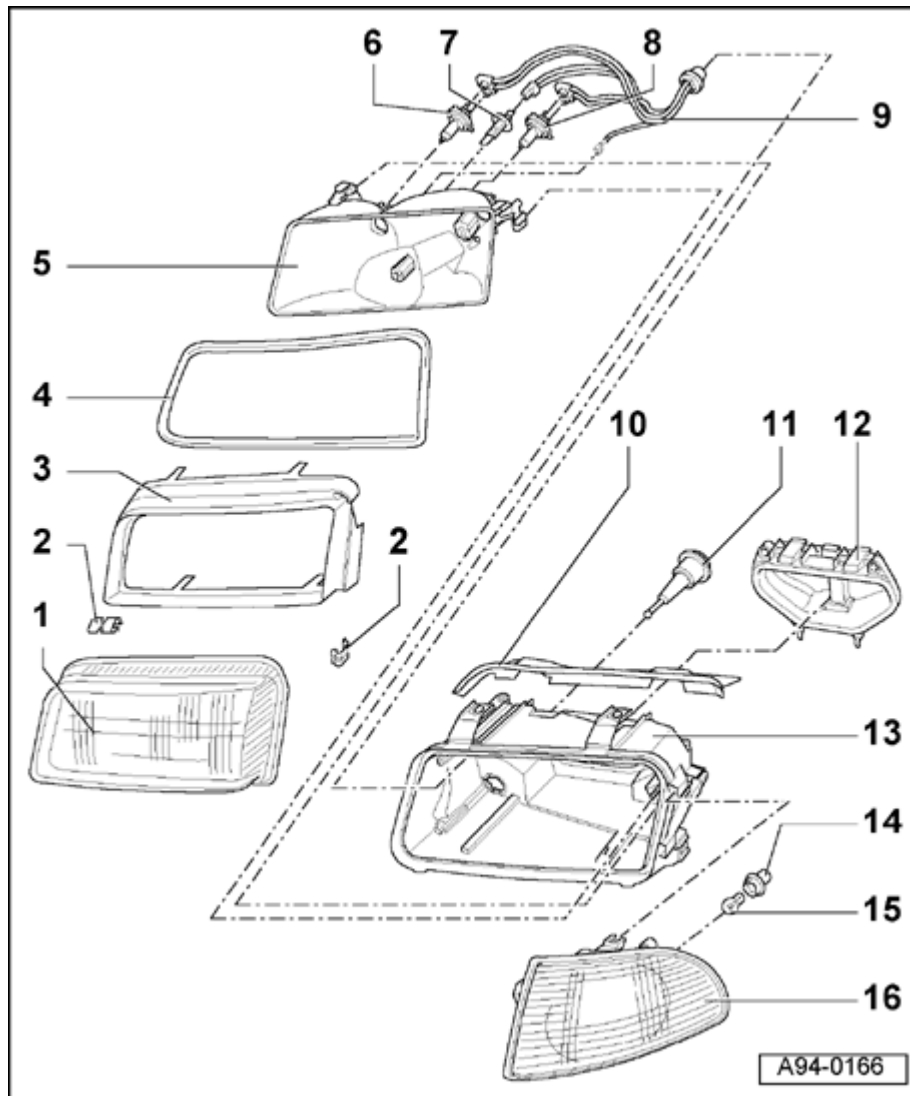
Three-way halogen headlights, overview

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

**Notes:**

- ◆ Some procedures could affect the headlight beam adjustment, requiring that it be reset ⇒ [Page 94-8](#).

⇒ [Repair Manual, Maintenance](#)

- ◆ Adjusting spray for headlights washer nozzles ⇒ [Page 92-17](#).

1 - Diffuser lens**2 - Retaining clamps (7x)**

- ◆ To remove, carefully pry out using screwdriver
- ◆ To install, press in by hand

3 - Headlight frame

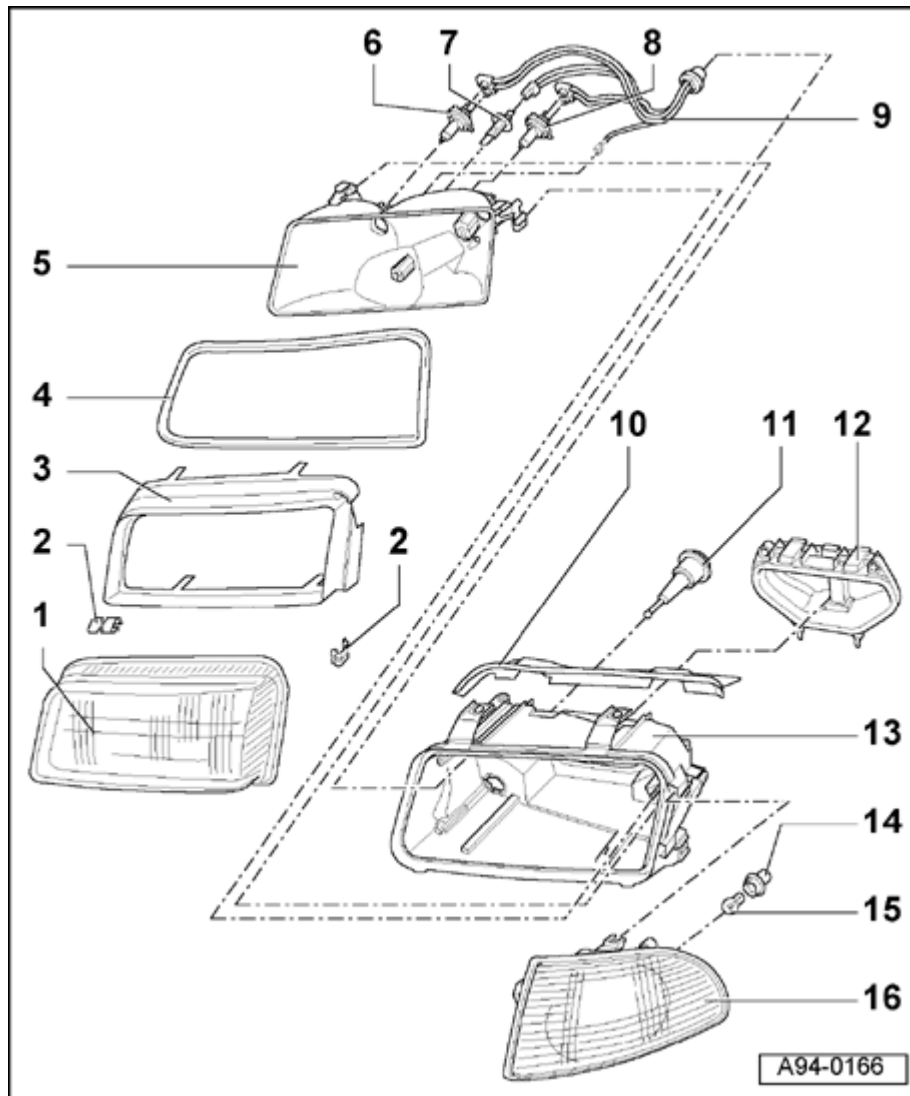
- ◆ Locked within headlight housing

4 - Seal for lens

- ◆ Always replace

5 - Reflector

- ◆ To remove, clip out of retaining rings
- ◆ To install, carefully press into retaining rings
- ◆ Do not touch inside of reflector

**6 - High beam bulb**

◆ 12 V, 55 W (H7)

7 - Front fog light bulb

◆ 12 V, 55 W (H1)

8 - Low beam bulb

◆ 12 V, 55 W (H7)

9 - Wiring with harness connector**10 - Trim strip**

◆ Clipped onto headlight housing

11 - Fixed bearing for reflector

◆ Only on vehicles without headlight automatic vertical aim control

12 - Cover

◆ Press lock down and remove toward rear

13 - Headlight housing**14 - Bulb socket****15 - Turn signal bulb**

◆ 12 V, 21 W, orange

16 - Turn signal lens

◆ Removing and installing ⇒ [Page 94-21](#)

High intensity gas discharge (Xenon) headlights, overview

CAUTION!

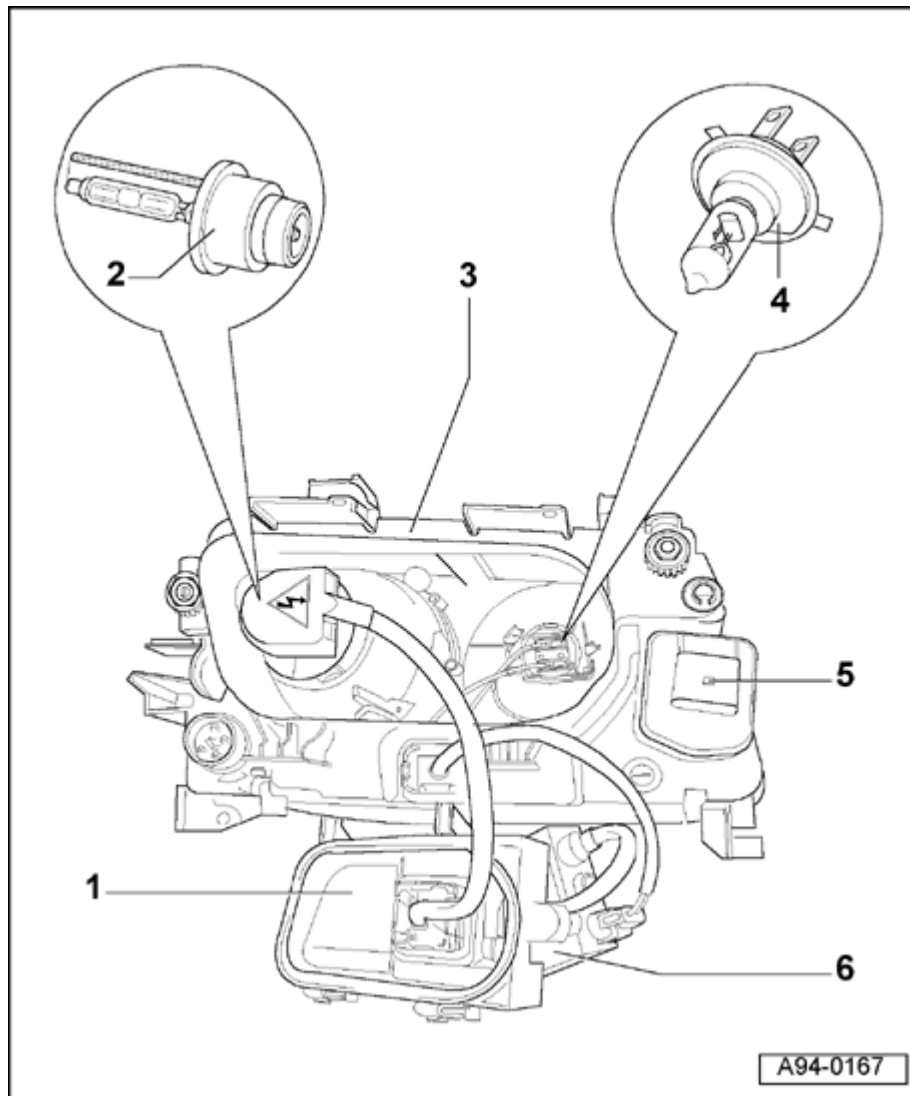
Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ Before disconnecting the battery, determine the correct coding for the anti-theft radio.
- ◆ After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.
- ◆ Some procedures could affect the headlight beam adjustment, requiring that it be reset ⇒ [Page 94-8](#) .

⇒ [Repair Manual, Maintenance](#)

- ◆ Adjusting spray for headlights washer nozzles
⇒ [Page 92-17](#) .

**1 - Housing cover****2 - Xenon bulb**

◆ 12 V, 35 W

◆ Replacing ⇒ [Page 94-12](#)

3 - Headlight housing**4 - High beam bulb**

◆ 12 V, 55 W (H7)

◆ Replacing ⇒ [Page 94-14](#)

5 - Headlight beam adjusting motor -V48/-V49-

◆ Removing and installing ⇒ [Page 94-11](#)

6 - Igniter for gas discharge lamps -N195-(Xenon)

◆ Removing and installing ⇒ [Page 94-15](#)

Headlights, removing and installing

Note:

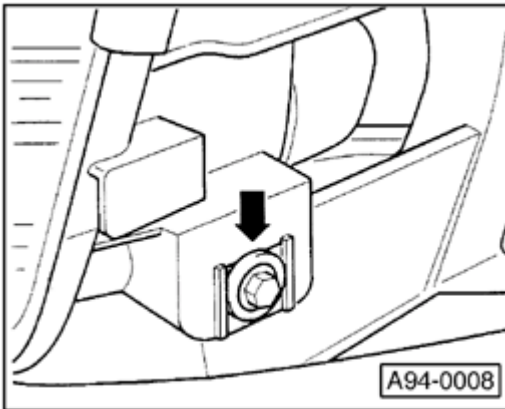
Protect bumper using cloth backed tape in headlight area to prevent damage to paint.

Removing

- Remove turn signal ⇒ [Page 94-21](#) .

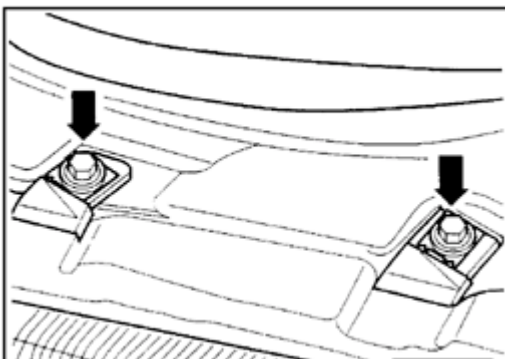
A

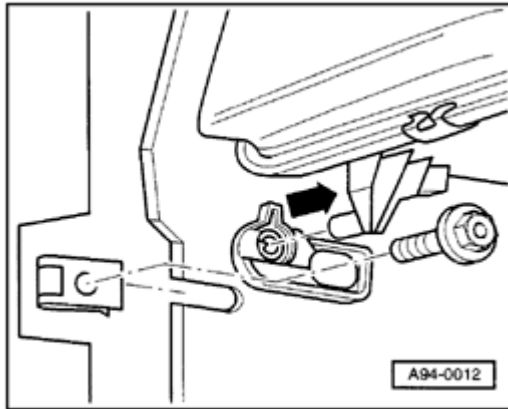
- Remove bolt (arrow) 6 Nm (53 in. lb).



A

- Remove two bolts (arrows) 6 Nm (53 in. lb).
- Disconnect headlight harness connector.
- Disconnect headlight beam adjusting motor harness connector.





A

- Pull headlight out from peg mount at side (approx. 15 mm), lift slightly and then lift out carefully toward front, rotating if necessary.

Installing

- Install in reverse order of removal.
- Always align headlights to adjacent body panels (gap clearances) before securing.
- Adjust headlights after assembly ⇒ [Page 94-8](#) .

Headlights, adjusting

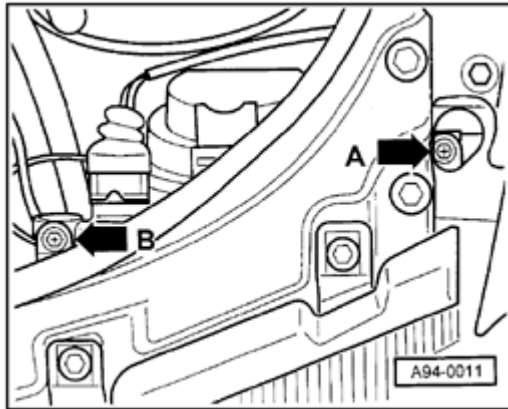
Instructions and specifications on headlight adjustment:

⇒ [Repair Manual, Maintenance](#)

Notes:

- ◆ *For vehicles with high intensity gas discharge (Xenon) headlights, the Diagnostic Trouble Code (DTC) memory must be checked and erased before each manual adjustment of the adjusting screws. The basic adjustment is then carried out. ⇒ Headlight automatic vertical aim control On board Diagnostic (OBD), initiating, ⇒ [Page 01-217](#) .*
- ◆ *The aimer must be used for the adjustment.*

⇒ [Repair Manual, Maintenance](#)

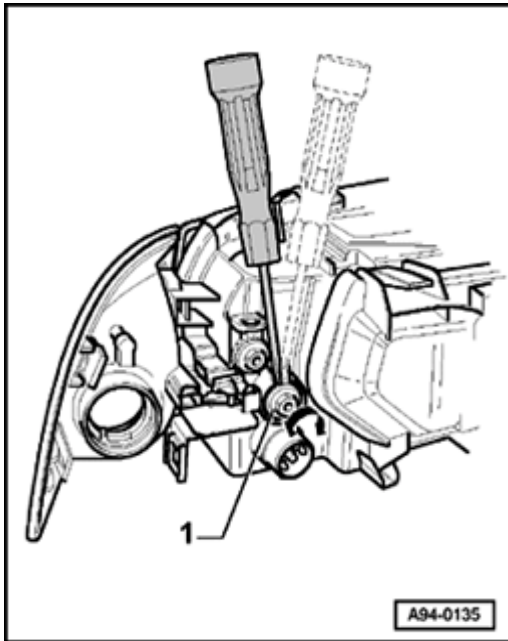


A

- Change headlight beam adjustment by turning adjusting screws -A- and/or -B- (use Phillips-head screwdriver or hex-wrench).

The illustration shows the left headlight:

Bosch
A - Lateral adjustment
B - Height adjustment



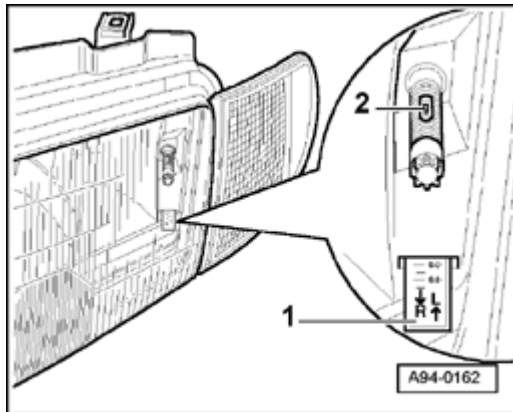
A

- Use screwdriver for lateral adjustment -1-.

Note:

The lateral adjustment must be set to "0."

94-10



A

- Checking lateral adjustment
- 1 - Lateral adjustment indicator
- 2 - Measuring bubble

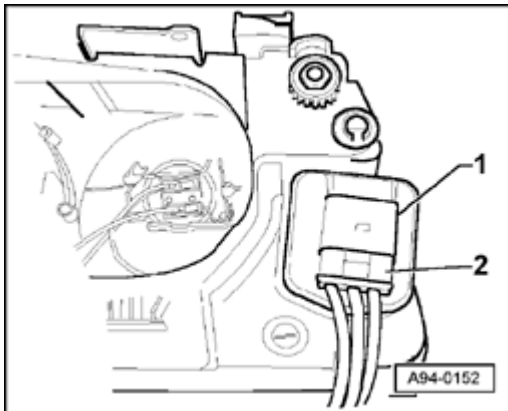
Headlight beam adjusting motor (high intensity gas discharge -Xenon-headlights), removing and installing

Note:

Always adjust headlights after headlight beam adjusting motors are removed, installed or replaced ⇒ [Page 94-8](#) .

Removing

- For right headlight, remove back portion of intake air duct.
- Remove cover from headlight housing.
- Release headlight beam adjusting motor -1- on right headlight by rotating clockwise and on left headlight by rotating counterclockwise.
- Release ball joint from its socket by pushing laterally to left on right headlight and push to right on left headlight.
- Disconnect harness connector -2-.



Installing

- Install in reverse order of removal.

High intensity gas discharge (Xenon) headlight bulbs, replacing

Replacing Xenon bulb for low beam

Removing

- Remove cover from headlight housing.

WARNING!

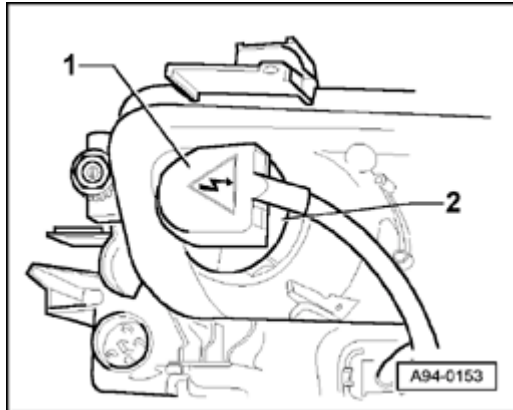
HIGH VOLTAGE!

Disconnect the battery Ground (GND) strap before working on parts of the Xenon headlight which are labeled with the yellow high voltage symbol.

Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

94-13

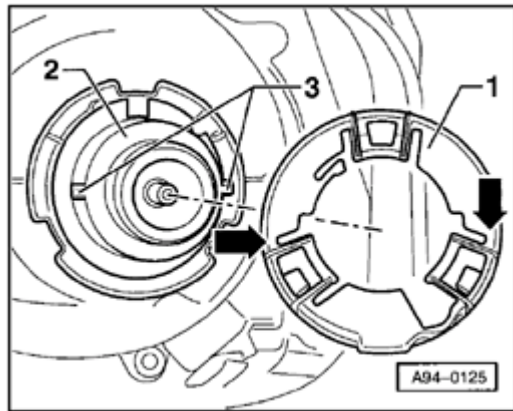


A

- Remove harness connector -1- on Xenon headlight and retaining ring -2- by rotating counterclockwise.

Installing

- Insert new bulb into housing without touching glass with bare hands.



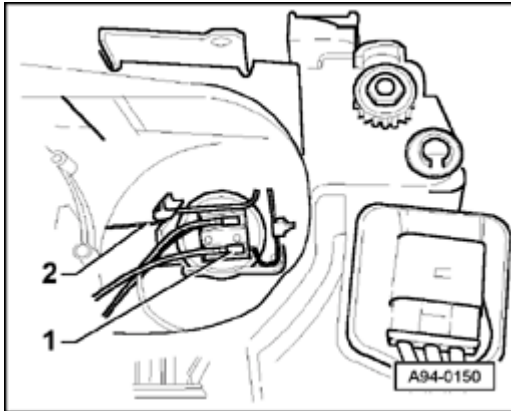
A

- Place retaining ring -1- on catches -3- of Xenon lamp -2- with two recesses (arrows) and secure by turning clockwise.
- Reconnect harness connector and close housing cover.

Replacing high beam bulbs

Removing

- Remove back portion of intake air duct on right headlight.
- Remove cover from headlight housing.
- Disconnect harness connector -1-.
- Release bulb retaining spring -2- and remove from housing.



Installing

- Insert new bulb into housing without touching glass with bare hands.
- Secure bulb with bulb retaining spring.
- Reconnect harness connector and close housing cover.
- Secure housing cover with bulb retaining spring.

Ignitor for gas discharge lamps -N195- (Xenon), removing and installing

WARNING!

HIGH VOLTAGE!

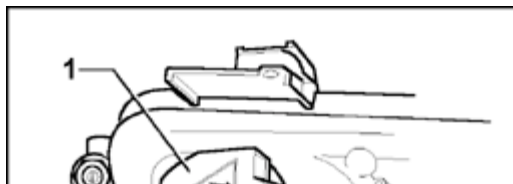
Disconnect the battery Ground (GND) strap before working on parts of the Xenon headlight which are labeled with the yellow high voltage symbol.

Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

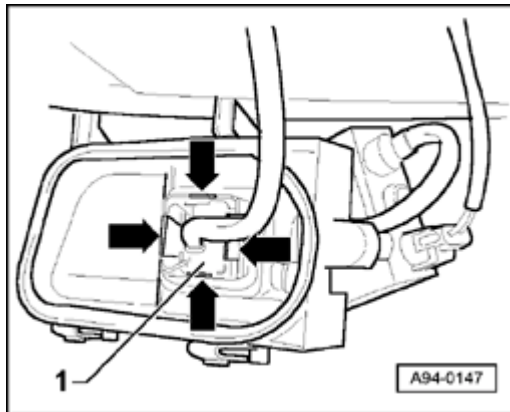
Removing

- Remove cover from headlight housing.
- Remove harness connector -1- on Xenon bulb by rotating counterclockwise.



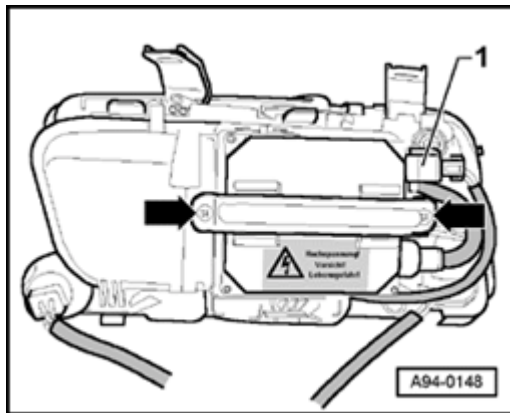
A

94-16



A

- Remove retainer -1- in housing cover by pressing catches (arrows).
- Guide harness connector for Xenon bulb through opening in cover.



A

- Disconnect harness connector -1- from ignitor's harness connector.
- Remove locking plate for ignitor by loosening screws (arrows).
- Remove starter from housing.

Installing

- Install in reverse order of removal.

94-17

Front fog lights, servicing

Front fog lights, removing and installing

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

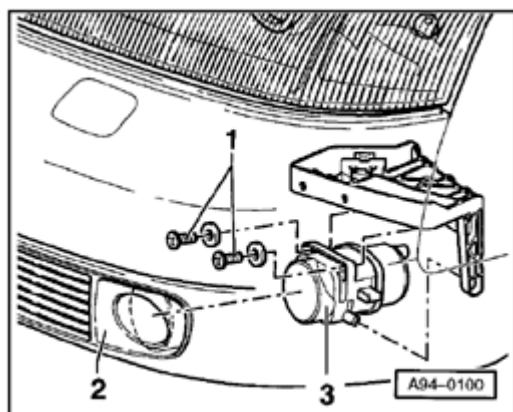
- Remove bumper

⇒ [Repair Manual, Body Exterior, Repair Group 63](#)

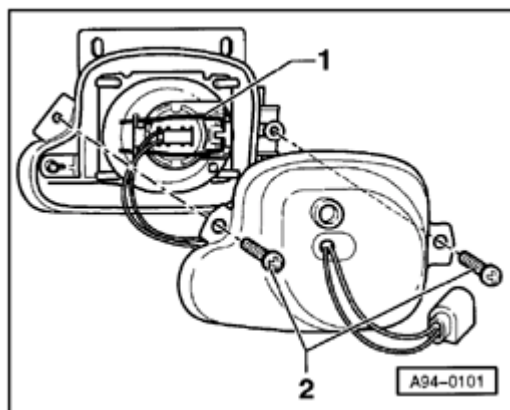
Removing

4

- Pry out plastic cover -2- and towing lug cover (right side) toward front.
- Remove two Torx[®] screws -1- (later Phillips-head screws).
- Remove headlight insert -3-.
- Disconnect harness connector.

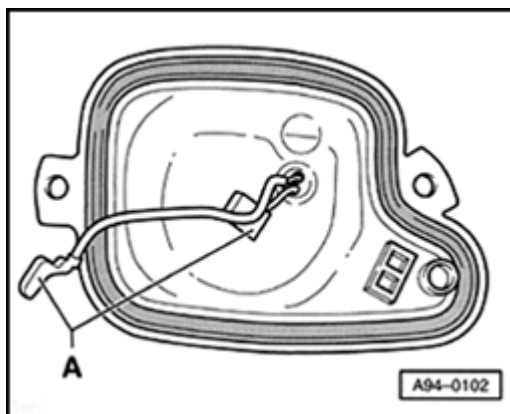


94-19



A

- Remove Phillips-head screws -2- on housing cover.
- Release bulb retaining spring -1- and remove light socket from housing.



A

- Remove lamp connector -A- from cable connector in housing cover.

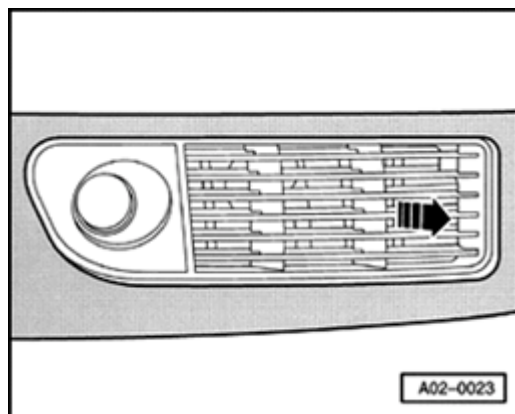
Installing

- Insert new bulb into light socket without touching glass with bare hands.
- Secure light socket with bulb retaining spring.
- Reconnect harness connector and close housing cover.
- Remainder of installation is in reverse order of removal.
- Adjust front fog lights after installing ⇒ [Page 94-20](#) .

Front fog lights, adjusting

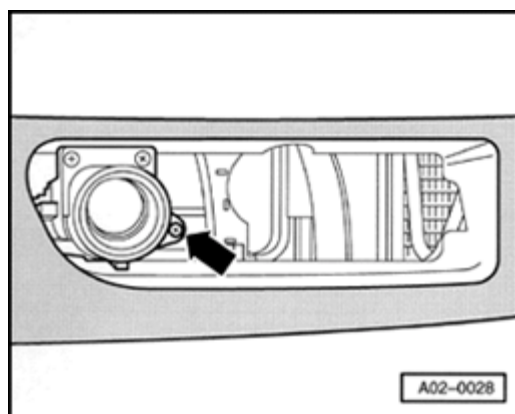
For adjustment specifications:

⇒ [Repair Manual, Maintenance](#)



A

- Pull off covers (arrow) from bottom part of bumper.



A

- Turn adjusting screw (arrow) counterclockwise to lower headlight level.
No lateral adjustment is provided.

Note:

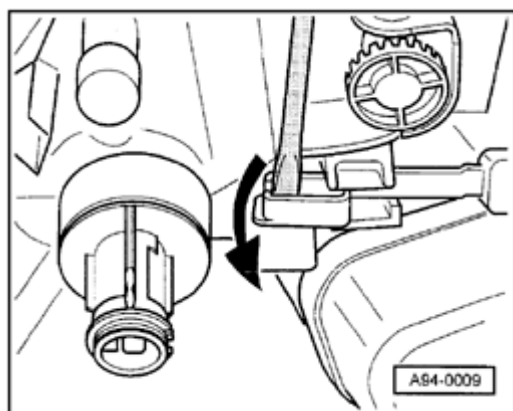
The illustration shows the right front fog light. For the left front fog light, the adjusting screw is in the mirror-image position.

94-21

Front turn signals, removing and installing

Note:

Turn signals can be removed with headlight assemblies installed.

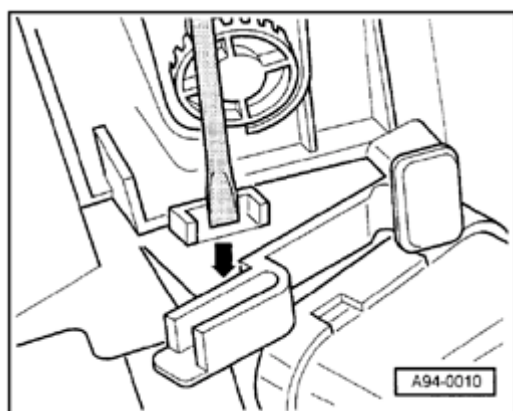


A

- Carefully press out release lever toward rear using screwdriver.

The position of the release lever depends on the headlight version:

- ◆ Standard headlights: release lever is attached to headlight housing
- ◆ Three-way headlights: release lever is attached to turn signal



A

- Press catch (lever) slightly down (arrow) and push turn signal lens out toward front.
- Disconnect harness connector and rotate and remove bulb assembly.

Side-mounted turn signals

Side-mounted turn signals, removing and installing

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

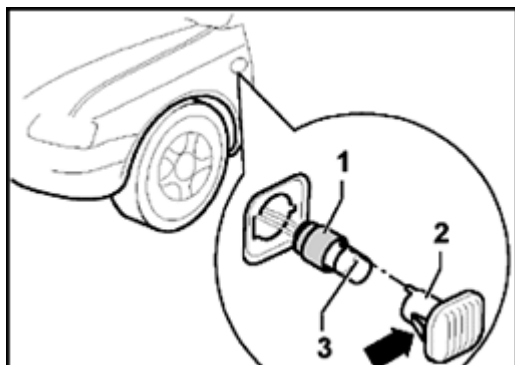
- ◆ Before disconnecting the battery determine the correct coding for the anti-theft radio.
- ◆ After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.

Removing

A

- Press side turn signal lens against retaining tab in direction of arrow and carefully remove from fender opening.
- Carefully pull housing -2- out of rubber socket -1-.
- Bulb -3- can be pulled out of rubber socket -1- for replacement.

Installing



- Install in reverse order of removal.

Steering column switch, servicing

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

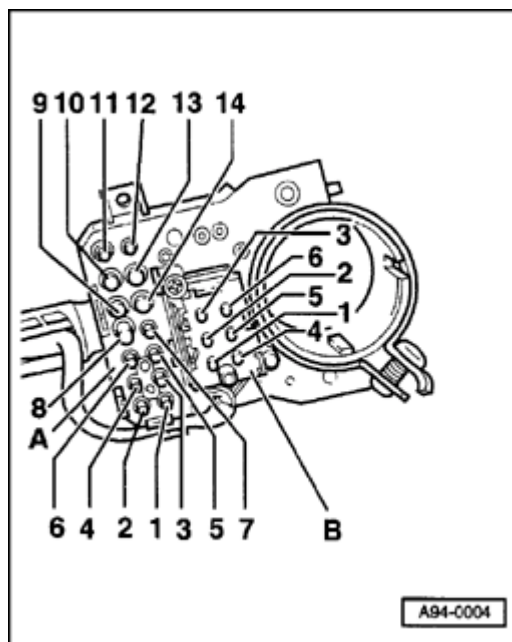
- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

Steering column switch, terminal assignments

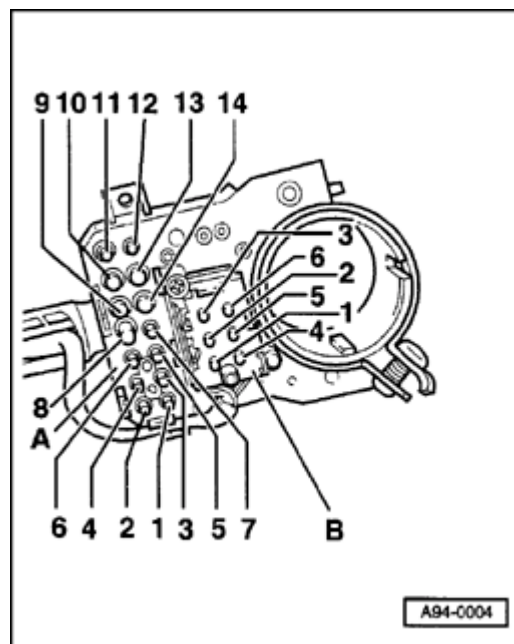
A Terminal assignments for light switch, turn signal switch, headlight dimmer switch and flasher, parking light switch and cruise control

A - 14-pin harness connector

- 1 - Light switch, terminal 58
- 2 - Switch, terminal 14
- 3 - Light switch, headlight dimmer switch and flasher, terminal 30
- 4 - Light switch and headlight dimmer switch and flasher, terminal 30
- 5 - Switch for parking light, terminal PL
- 6 - Switch for parking light, terminal P
- 7 - Switch for parking light, terminal PR
- 8 - Light switch, terminal 11 (daytime running lights/dimmer lighting)
- 9 - Headlight dimmer switch and flasher, terminal 56 b
- 10 - Headlight dimmer switch and flasher, terminal 56 a
- 11 - Headlight dimmer switch and flasher, terminal 56
- 12 - Light switch, terminal 1 (daytime running lights/dimmer lighting)
- 13 - Light switch, terminal X
- 14 - Light switch, terminal 3 (daytime running lights/dimmer lighting)

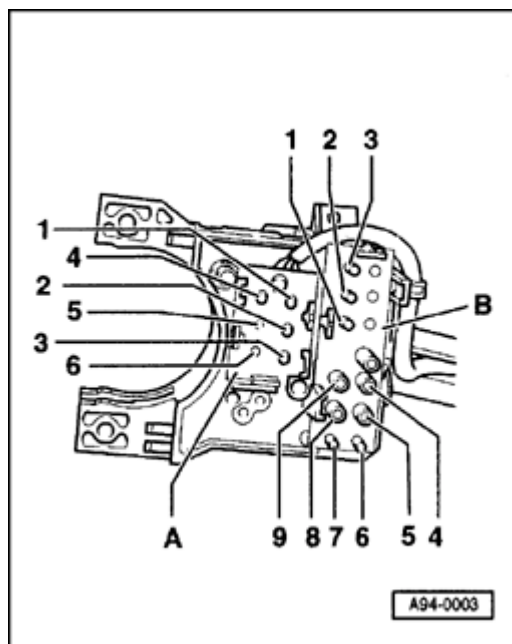


94-39



⚡ **B - 6-pin connector, cruise control system**

- 1 - On and resume
- 2 - Resume
- 3 - Set
- 4 - Terminal 15
- 5 - On, resume, and off (click stop engaged)
- 6 - Input from control module, terminal 3



Wiper switch pin assignment

A - 6-pin connector

- 1 - Board computer, reset
- 2 - Board computer, Terminal 31
- 3 - Board computer, right rocker switch
- 4 - Board computer, left rocker switch
- 5 - open
- 6 - open

B - 13-pin harness connector

- 1 - Wiper switch, terminal J
- 2 - Wiper switch, terminal 53 c
- 3 - Emergency light (hazard light) switch, terminal R
- 4 - Wiper switch, terminal 53 b
- 5 - Wiper switch, terminal 53 a
- 6 - Emergency light (hazard light) switch, terminal L
- 7 - Emergency light (hazard light) switch, terminal 49 a
- 8 - Wiper switch, terminal 53 e
- 9 - Wiper switch, terminal 53

94-41

Ignition switch lock cylinder, servicing

Steering lock cylinder - ignition switch removing and installing

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ *Before disconnecting the battery determine the correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

Notes:

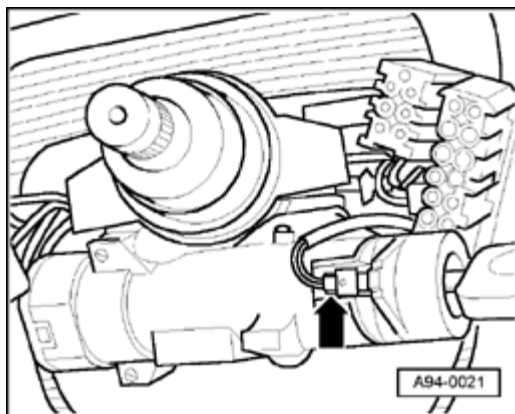
- ◆ *For removing, the lock cylinder, always use the spare key or shop key with the flat plastic handle.*
- ◆ *The master key equipped with a light and/or remote control transmitter in its handle is*

unsuitable for removal because the keys broad handle covers an access hole in the lock cylinder.

Removing

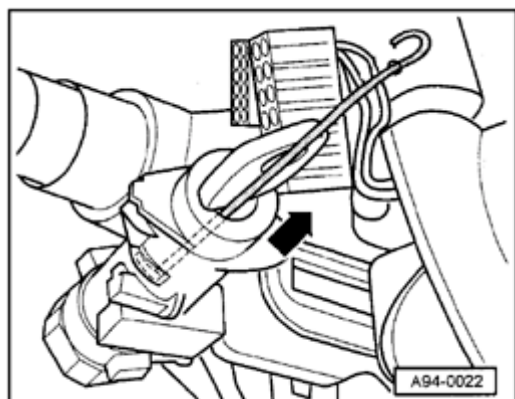
- Remove driver's-side airbag unit and steering wheel.

⇒ [Repair Manual, Body Interior, Repair Group 69](#)



4

- Remove steering column switches ⇒ [Page 94-37](#) .
- Insert spare or shop key and switch ignition on: access hole will appear in front of switch next to ignition key slot.



4

- Insert length of steel wire or small screwdriver (approx. 2 mm dia.) as far as it will go, as illustrated, and pull lock cylinder out of steering lock housing in direction of arrow.

Installing

- Ignition switch must be in "ignition on" position.
- Push lock cylinder with ignition key all way into steering lock housing

and press in firmly until catch engages audibly.

- Install steering column switches and steering wheel.

Ignition switch, removing and installing

Removing

Note:

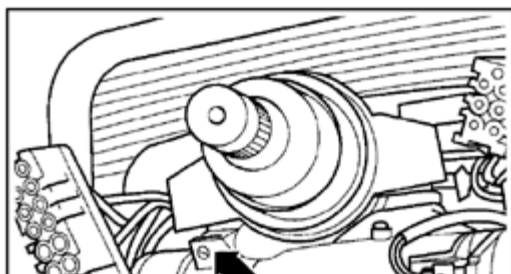
It is not necessary to remove the lock cylinder.

- Disconnect battery Ground (GND) strap.
- Remove driver's-side airbag unit and steering wheel.

⇒ [Repair Manual, Body Interior, Repair Group 69](#)

- Remove steering column switch ⇒ [Page 94-37](#).
- Disconnect harness connector from ignition/starter switch.
- Remove sealing paint from threads of screws -A-.
- Loosen two screws (arrows -A-) slightly and pull ignition/starter switch out of housing in direction indicated (arrow).

Installing

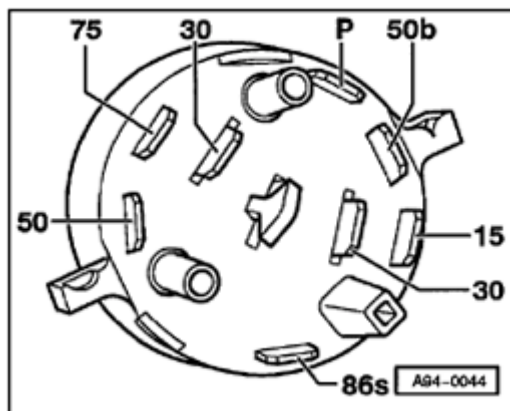


Notes:

- ◆ *The ignition switch and lock cylinder must be in the same position, e.g. "Ignition on" when installing.*
- ◆ *After installing, seal the screws again with pain.*
- Install in reverse order of removal.

94-44

Ignition switch, terminal assignments



- 15 - Terminal 15
- 30 - Terminal 30
- 50 - Terminal 50
- 50b-Terminal 50b
- 75 - Terminal 75
- 86s- Terminal 86s
- P - Park

96-1

Center console switches, removing and installing

CAUTION!

***Disconnect the battery Ground (GND) strap
before working on the electrical system.***

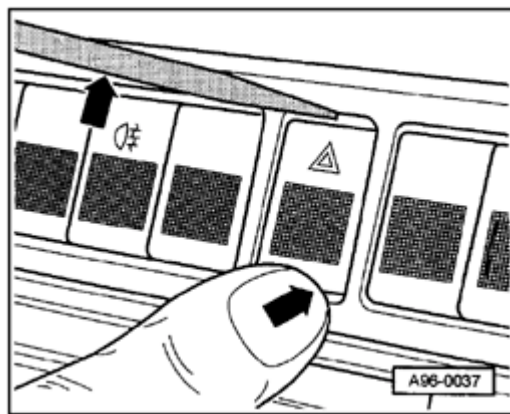
Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

96-2

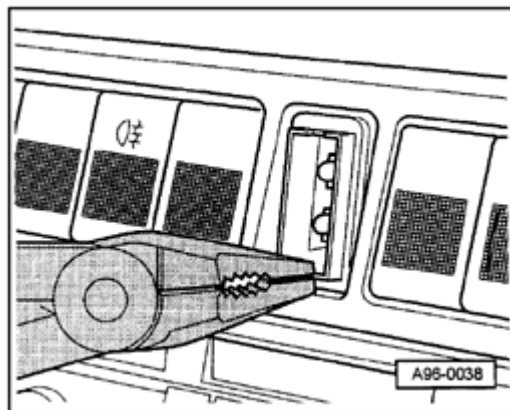
Switches, removing and installing

Removing



A

- Insert small screwdriver or flat plastic tool as shown, press against opposite side of switch and pry off switch plate.
- Tape off area above switches or front of radio with masking tape, if necessary.



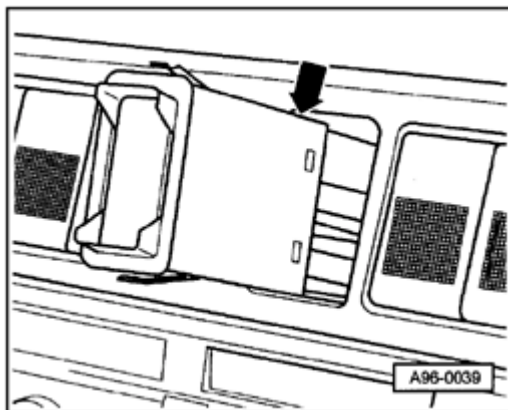
A

- Pull switch out forward using standard or flat-nose pliers.
- Disconnect harness connector.

Installing

- Press switch plate onto switch so it engages audibly.
- Connect harness connector and press switch in by hand as far as possible.

Emergency flasher relay, location



The emergency flasher relay is integrated in the emergency flasher switch.

- Removing and installing ⇒ [Page 96-2](#) .

Interior lights, servicing

CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

Front reading/interior lights, removing and installing

Front reading/interior lights with sunroof switch

Notes:

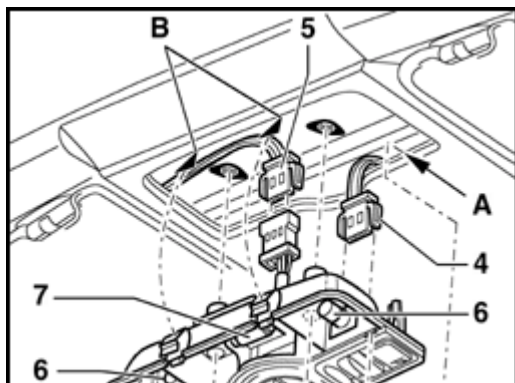
- ◆ To replace the bulb, pry off the lens.
- ◆ Bulb for interior light -7-: 12 V, 10 W
- ◆ Bulb for reading lights -6-: 12 V, 5 W

Removing

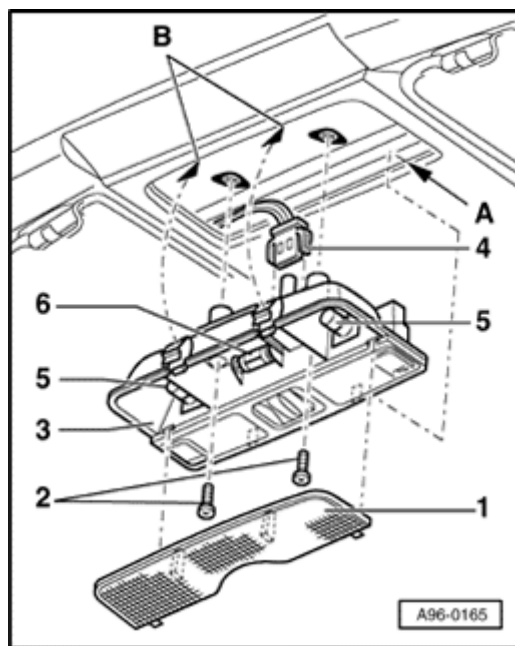
- Carefully pry off lens -1- using flat screwdriver.
- Remove both Phillips-head screws -2-.
- Pry out hooks at -B- using screwdriver and then remove interior/reading light with sunroof switch -3- from roof.
- Disconnect both harness connectors -4- and -5-.

Installing

- Connect harness connectors -4- and -5-.



- Insert interior/reading lights with sunroof switch -3- at -A-, and clip it in on opposite side at -B-.
- Secure with Phillips-head screws -2- and reinstall lens -1-.



Interior/reading lights without sunroof switch

Notes:

- ◆ To replace the bulb, pry off the lens.
- ◆ Bulb for interior light -6-: 12 V, 10 W
- ◆ Bulb for reading lights -5-: 12 V, 5 W

Removing

- Carefully pry off lens -1- using flat screwdriver.
- Remove both Phillips-head screws -2-.
- Pry out hooks at -B- using screwdriver and then remove interior/reading light -3- from roof.
- Disconnect harness connector -4-.

Installing

- Connect harness connector -4-.
- Insert interior/reading light -3- at -A-, and clip it in on opposite side at -B-.
- Secure with Phillips-head screws -2- and reinstall lens -1-.

Rear interior/reading lights, removing and installing (sedan)

Notes:

- ◆ To change bulbs, remove the rear reading lights.
- ◆ Bulb for reading light: 12 V, 5 W (2x)

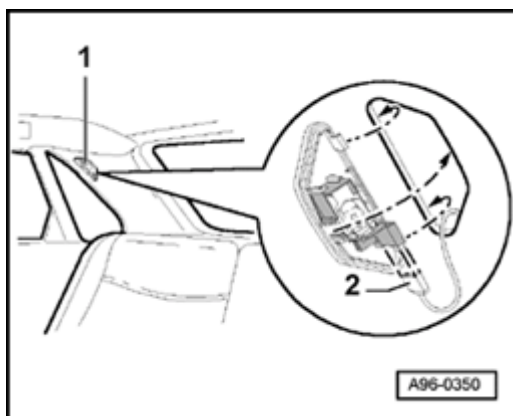
Removing

A

- Carefully pry out interior/reading light -1- using flat screwdriver.
- Disconnect harness connector -2-.

Installing

- Install in reverse order of removal.



Trunk lights, removing and installing

Notes:

- ◆ To change bulbs, remove trunk lights.
- ◆ Bulb for trunk light: 12 V, 5 W (2x)

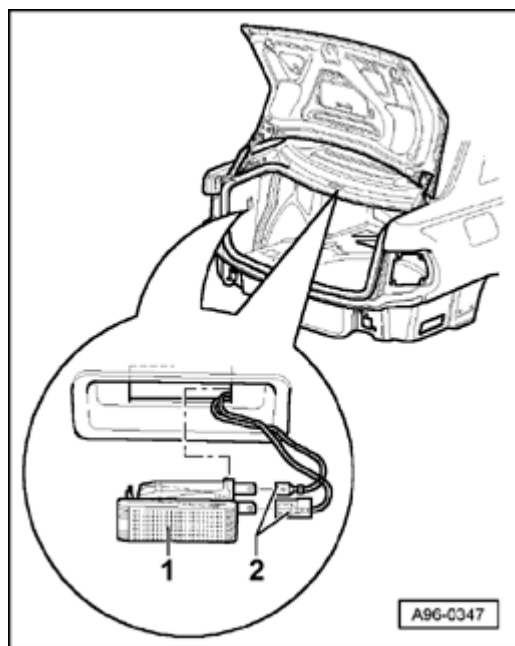
Removing

4

- Carefully pry out trunk light -1- using flat screwdriver.
- Disconnect harness connector -2-.

Installing

- Install in reverse order of removal.



Glove compartment light, removing and installing

Notes:

- ◆ To change bulbs, remove glove compartment light.
- ◆ Bulb for glove compartment light: 12 V, 5 W

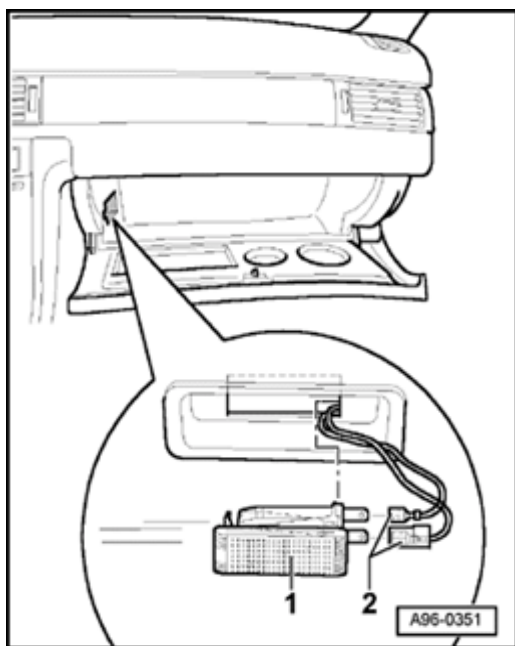
Removing

A

- Carefully pry out glove compartment light -1- using flat screwdriver.
- Disconnect harness connector -2-.

Installing

- Install in reverse order of removal.



Footwell lights, removing and installing

Note:

- ◆ To change bulbs, remove footwell lights.
- ◆ Bulb for footwell light: 12 V, 5 W (2x)

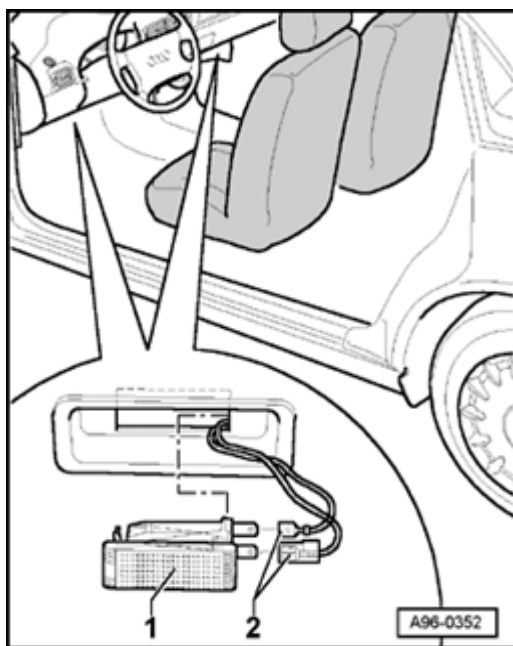
Removing



- Carefully pry out footwell light -1- using flat screwdriver.
- Disconnect harness connector -2-.

Installing

- Install in reverse order of removal.



96-11

Vanity mirror light, removing and installing

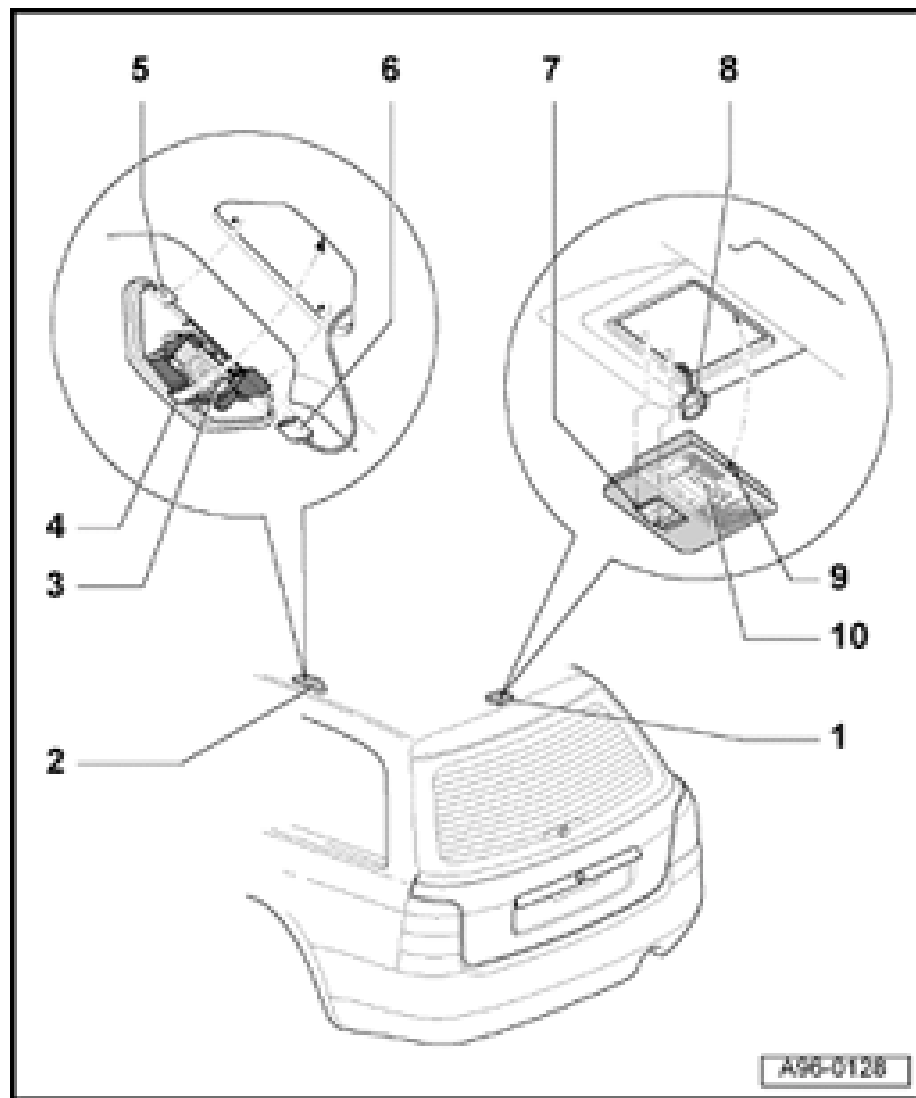
Note:

The vanity mirror light is integrated into the sun visor. The entire sun visor must be replaced when there is a malfunction.

- Remove sun visor.

⇒ [Repair Manual, Body Interior, Repair Group 70](#)

96-12



Interior lights, servicing (Avant)

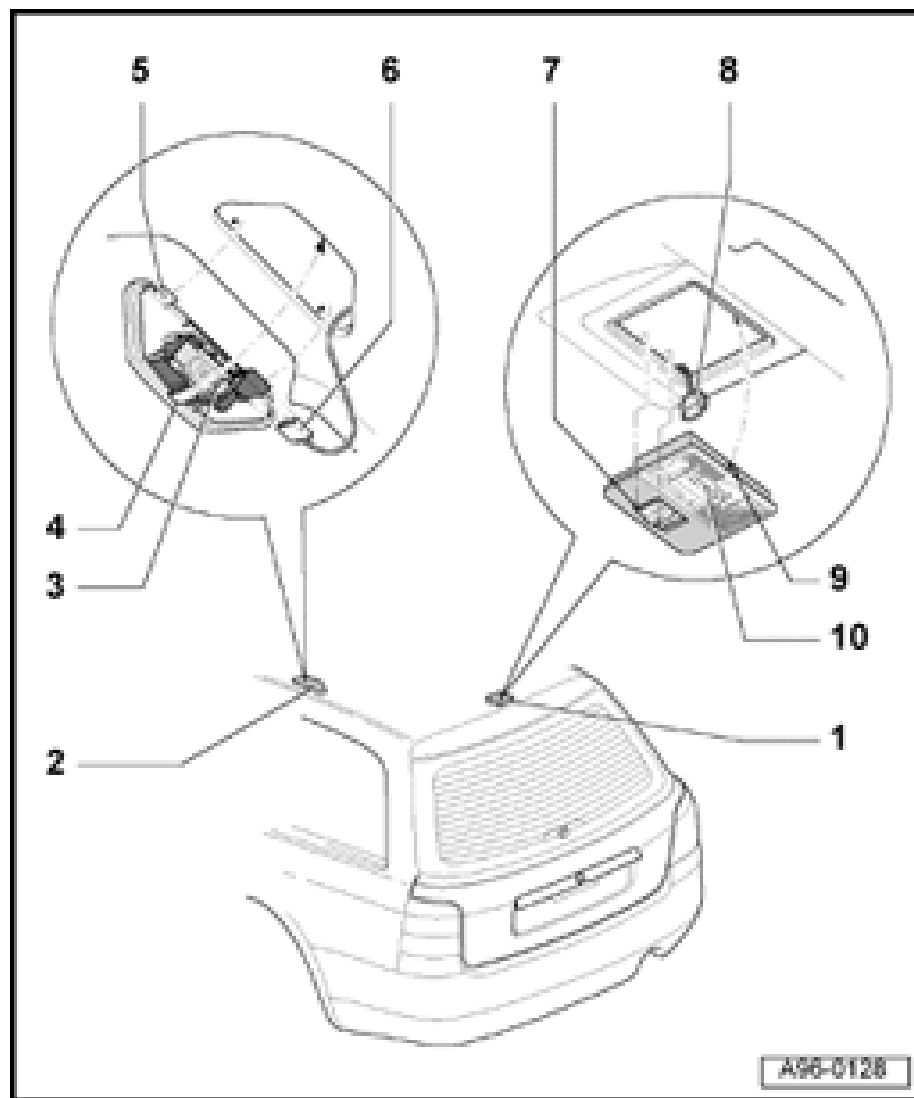
CAUTION!

Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ Before disconnecting the battery, determine the correct coding for the anti-theft radio.
- ◆ After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.

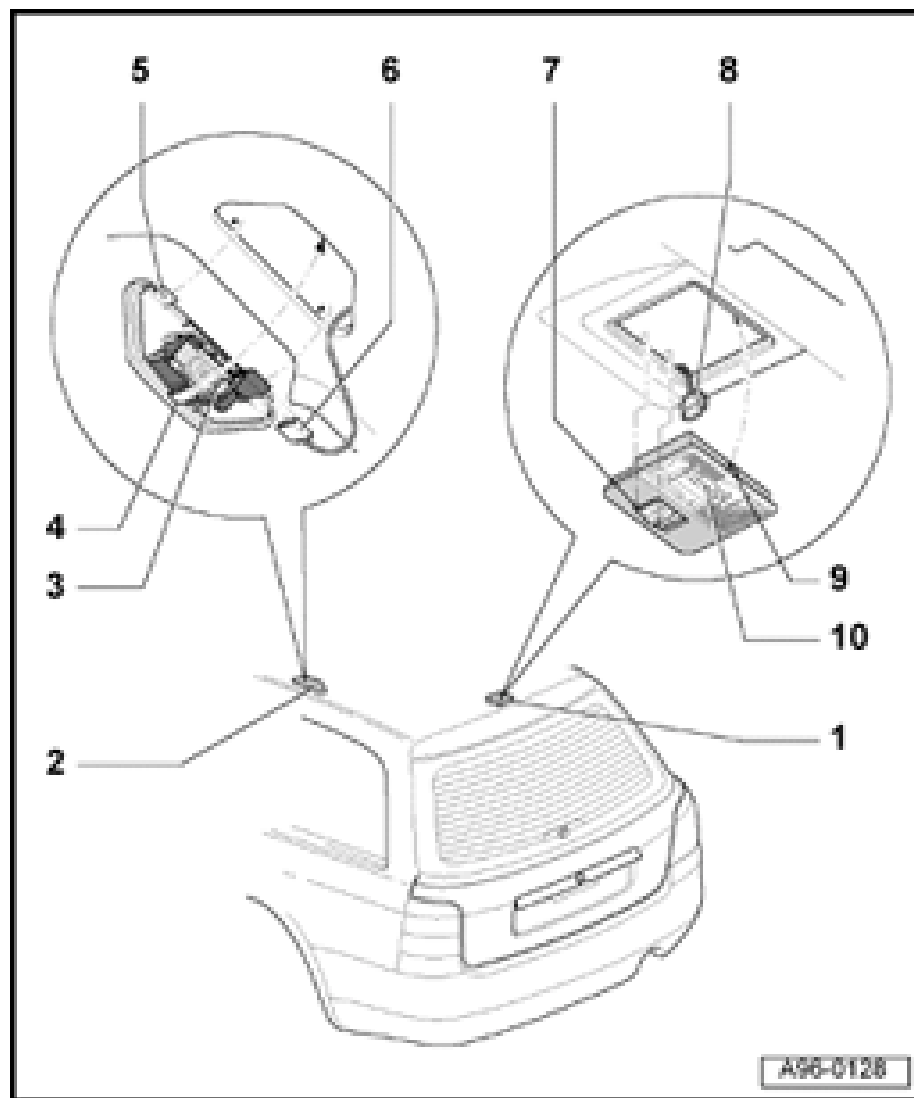
96-13



Complete overview

- 1 - Cargo area light
- 2 - Rear interior/reading light, right and left sides
- 3 - Bulb for reading light
 - ◆ 12 V, 5 W
- 4 - Catch
- 5 - Positioning hooks (2x)
- 6 - Reading light harness connector
- 7 - Positioning hooks (2x)
- 8 - Cargo area light harness connector
- 9 - Catch
- 10 - Bulb for cargo area light
 - ◆ 12 V, 10 W

96-14



Rear interior/reading lights, removing and installing

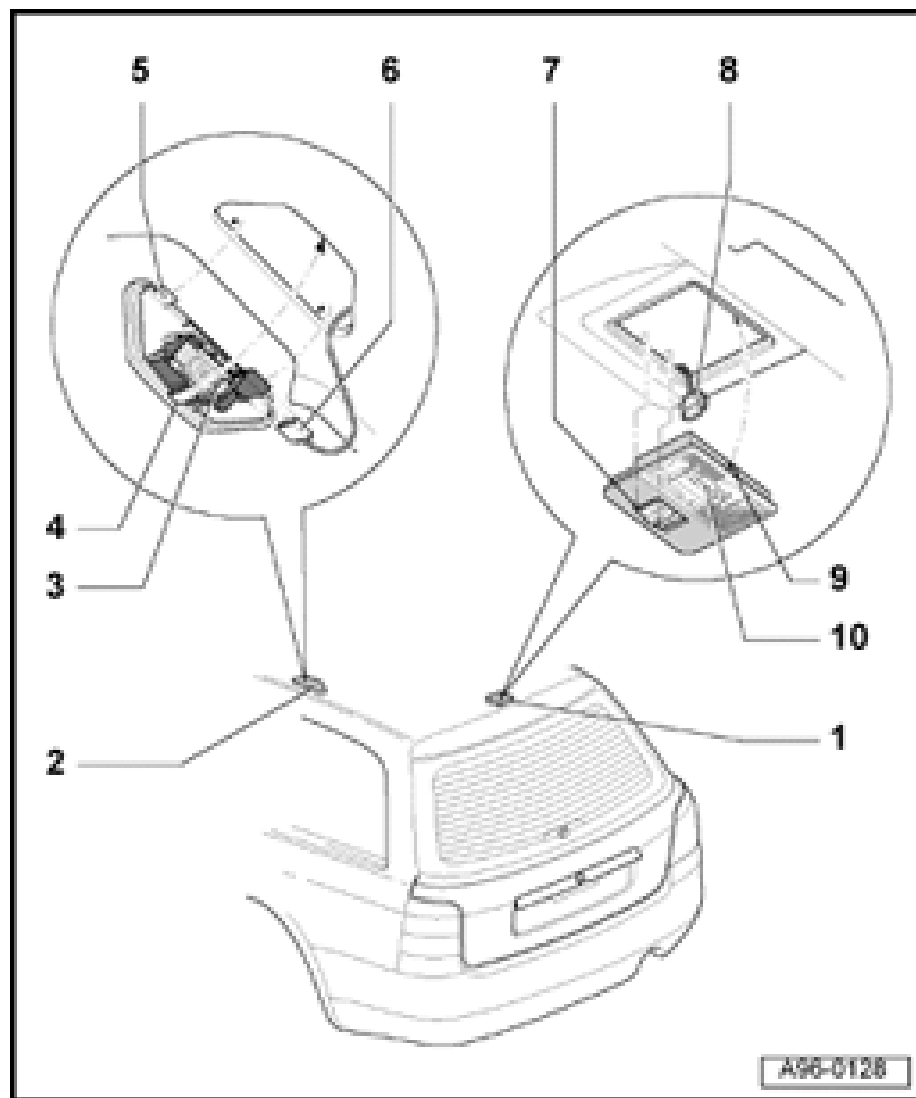
Removing

- Using screwdriver, carefully pry out interior/reading light -2- from roof at catch -4-.
- Disconnect harness connector -6-.
- Remove bulb -3- from socket.

Installing

- During installation, insert positioning hooks -5- and, on opposite side, make sure that catch -4- engages audibly.
- Remainder of installation is in reverse order of removal.

96-15



Cargo area light, removing and installing

Removing

- Using screwdriver, carefully pry out cargo area light -1- from roof at catch -9-.
- Disconnect harness connector -8-.
- Remove lens from lamp holder.
- To change bulb, remove bulb from clamp-type socket.

Installing

- During installation, insert positioning hooks -7- and, on opposite side, make sure that catch -9- engages audibly.
- Remainder of installation is in reverse order of removal.

Lock cylinder heating, servicing

CAUTION!

***Disconnect the battery Ground (GND) strap
before working on the electrical system.***

Notes:

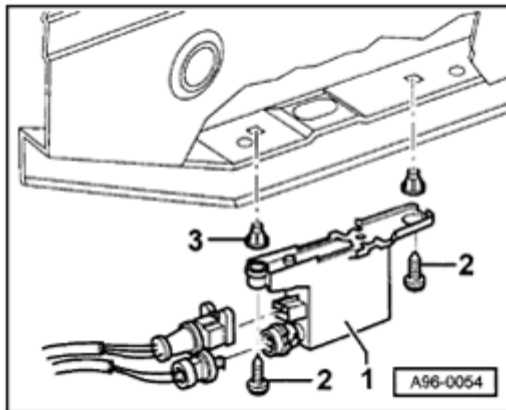
- ◆ *Before disconnecting the battery, determine correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

Heated door lock control module, removing and installing

Removing

- Remove door trim.

⇒ [Repair Manual, Body Interior, Repair Group 70](#)



4

- Remove screws -2- from plastic nuts -3-.
- Disconnect harness connector and remove control module -1-.

Installing

- Install in reverse order of removal.

Relay panel, fuse panel

CAUTION!

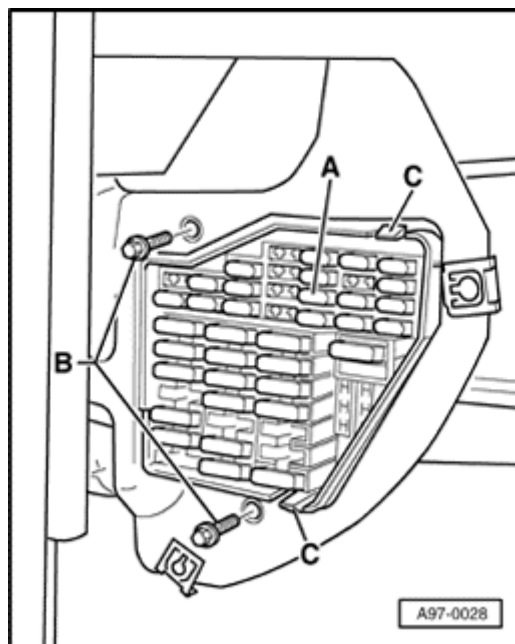
Disconnect the battery Ground (GND) strap before working on the electrical system.

Notes:

- ◆ *Before disconnecting the battery, determine the correct coding for the anti-theft radio.*
- ◆ *After reconnecting the battery, check and activate the vehicle's electrical equipment (radio, clock, comfort and convenience features, etc.) as outlined in this Repair Manual or the Owner's Manual.*

Fuse panel, removing and installing

- Carefully pry off side cover from instrument panel.
- Remove both mounting bolts -B- (2 Nm or 18 in. lb), then depress tabs -C- and remove fuse panel -A- toward rear.



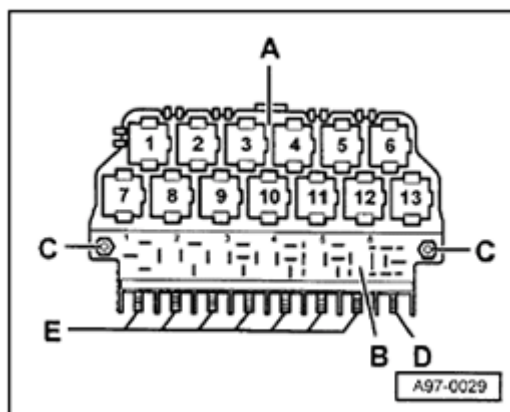
Central electric unit and relay panel, removing and installing

Note:

The relay panel is only required for certain optional equipment, and is not standard equipment.

- Remove driver's-side knee bar.

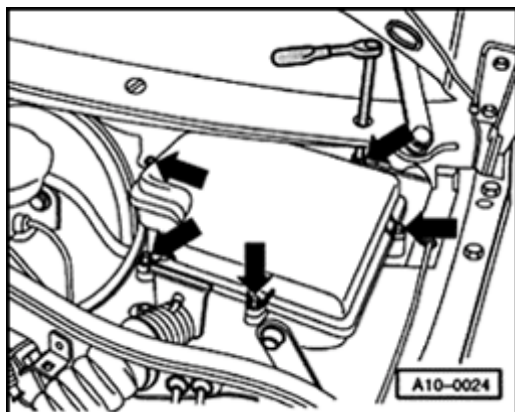
⇒ [Repair Manual, Body Interior, Repair Group 68](#)



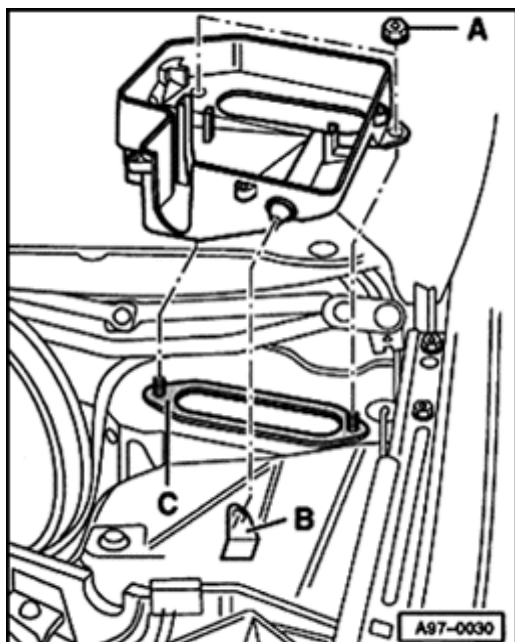
4

- Remove both mounting bolts -C- (2 Nm or 18 in. lb) and disconnect all screw connections -D- and -E- if necessary.
- Pull out relays and control modules and then unclip relevant relay panel.
- Remove central electric unit -B- and relay panel -A- from bottom.

Electronics box (E-box) in plenum chamber, removing and installing

**A**

- Remove mounting bolts (arrows) and pull off cover.
- When installing, press cover on by hand and tighten mounting bolts in diagonal sequence. Tightening torque: 4 Nm (35 in. lb) (also see information on cover).
- Remove engine control module and, if necessary, remove auxiliary relay panel/auxiliary fuse panel ⇒ [Page 97-5](#) .
- Disconnect harness connector at connector station.
- Pull out engine wiring harness together with rubber grommet from opening in electronics box.

**A**

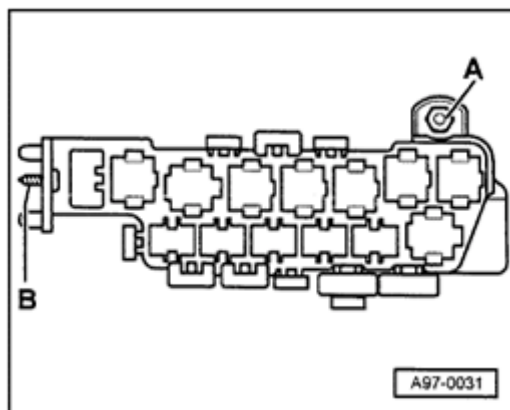
- Remove both nuts -A- (4 Nm or 35 in. lb).
- Lift electronics box off studs at rear and pull out of mount -B-.

Note the following when installing:

- Install in reverse order of removal.
- Always replace seal -C-: seal must not overlap opening in body and edge of sheet metal.

Auxiliary relay panel/auxiliary fuse panel, removing and installing

Location: in footwell, bottom left.



- Remove nut -A- (2 Nm or 18 in. lb) and self-tapping screw -B-.
- Remove relay and control module, unclip relay carrier and, if necessary, unclip auxiliary relay panel.
- Pull out auxiliary relay panel from retainers and remove from below.
- Install in reverse order of removal.

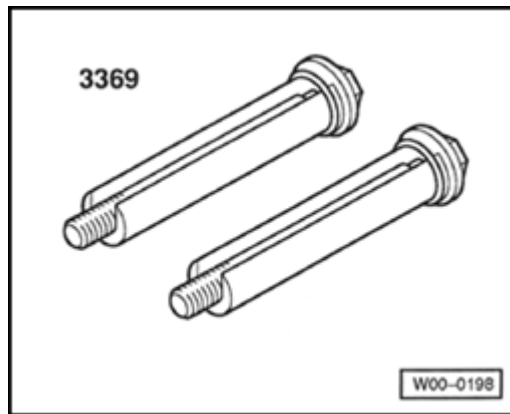
13-1

Engine, disassembling and assembling

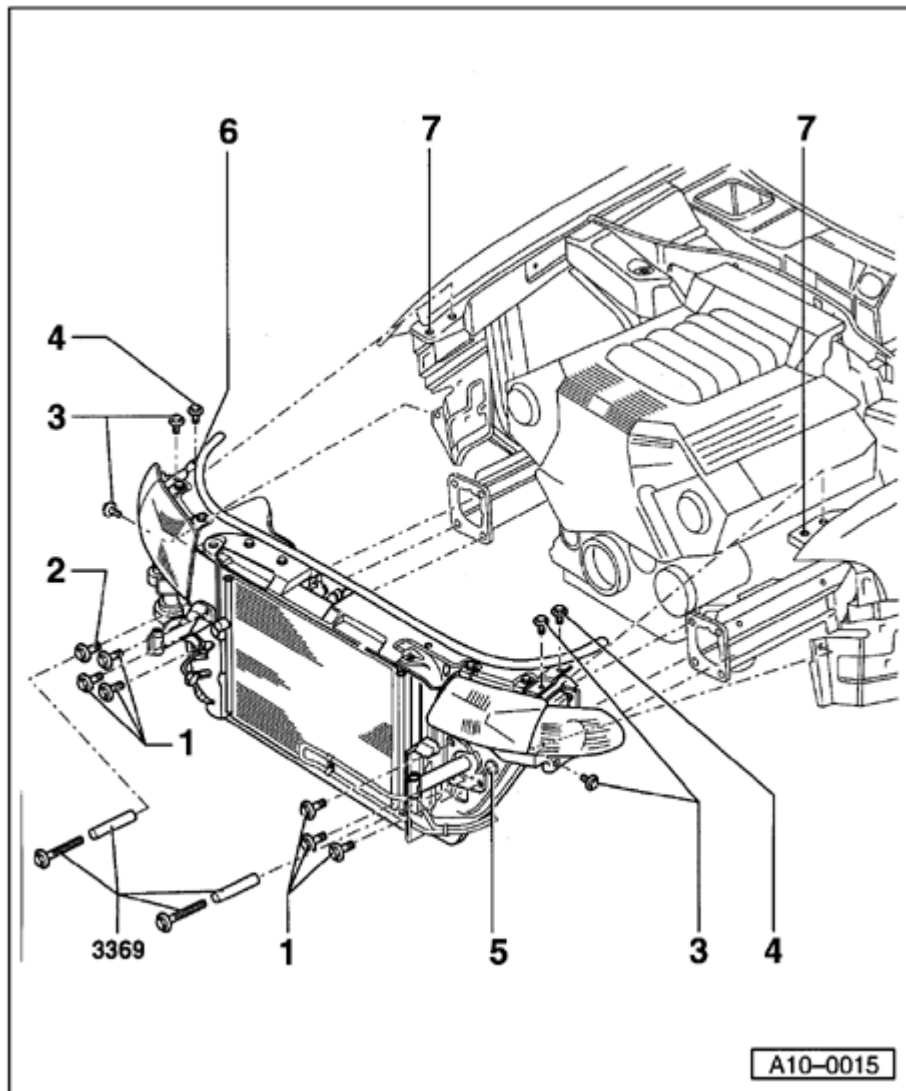
Lock carrier, moving into service position

Special tools and equipment

- ◆ Special tool 3369



13-2



1 - 45 Nm

2 - 45 Nm

3 - 10 Nm

4 - 10 Nm

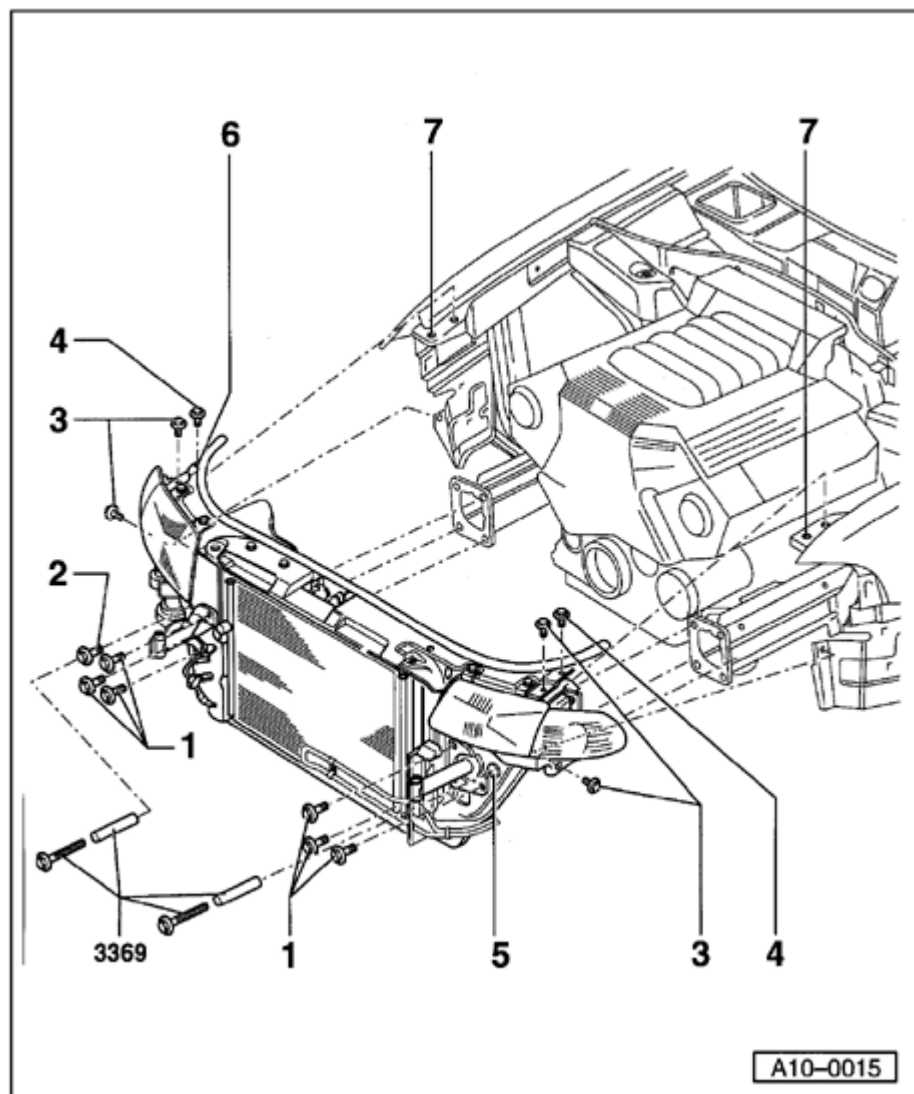
5 - Bore

◆ For special tool 3369

6 - Hole in lock carrier

7 - Bore in fender panel

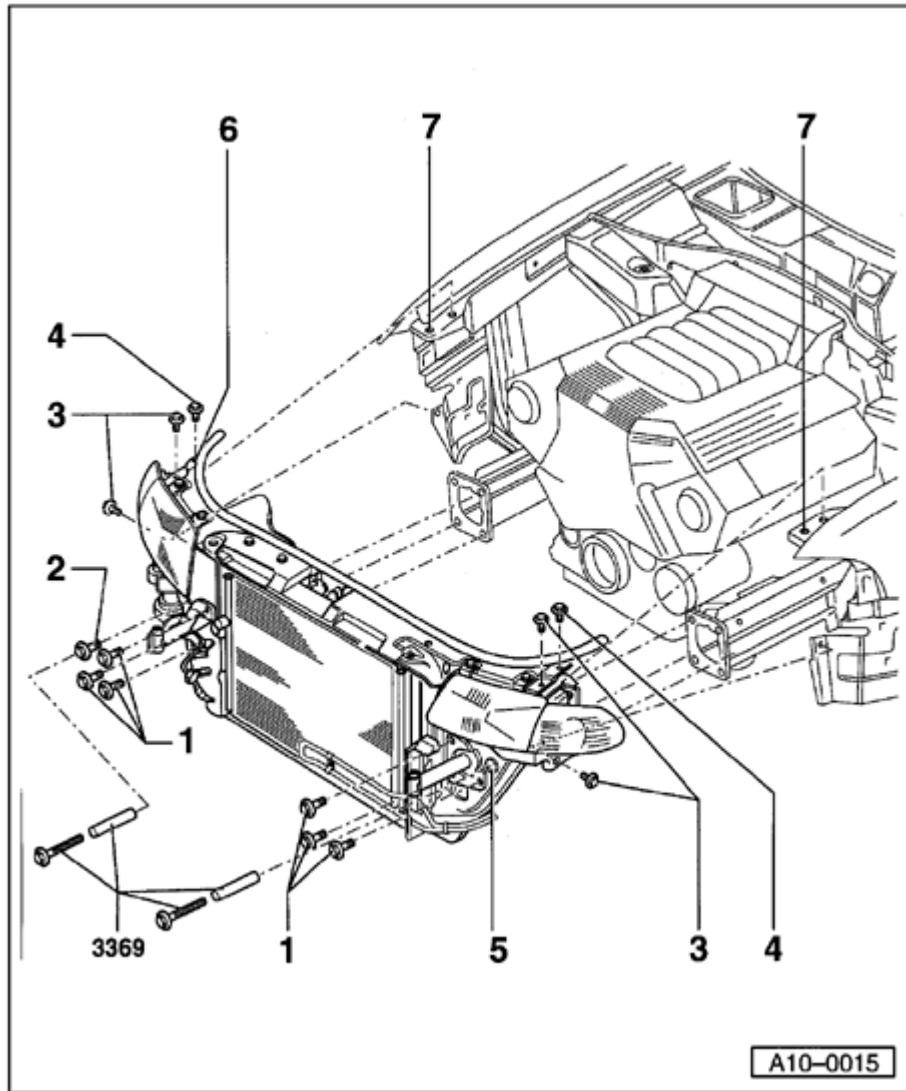
A10-0015



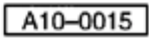
Removing

- Remove sound insulation ⇒ Fig. ⇒ [1](#) , ⇒ [Page 13-6](#)
- Remove front bumper:
⇒ [Repair Manual, Body Exterior, Repair Group 63](#)
- Remove lower air duct hose to charge air cooler
⇒ Fig. ⇒ [2](#) , ⇒ [Page 13-6](#)
- Remove air duct between lock carrier and air filter ⇒ Fig. ⇒ [3](#) , ⇒ [Page 13-7](#)
- Remove retaining clips (if installed) for wiring harness on left at radiator shroud.

13-4



- Remove bolt -2- and screw in special tool 3369.
- Screw in special tool 3369 into bore -5-.
- Remove bolts -1- and -3-.
- Remove bolts -4- and pull lock carrier out as far as it will go.
- Secure lock carrier with suitable M6 bolts in hole -6- (lock carrier) and hole -7- (fender panel).



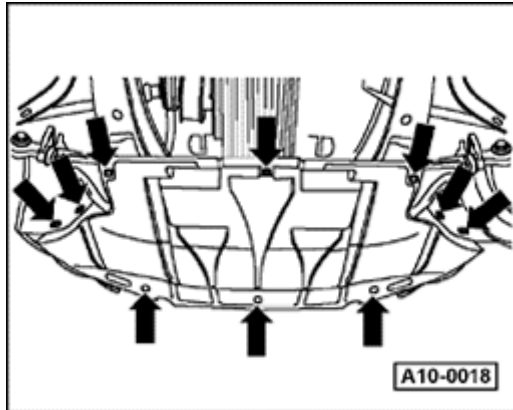
Installation is carried out in the reverse order of removal; note the following:

- When lock carrier has been installed, check that wiring next to radiator is correctly routed.
- Adjust limit stop for torque reaction support ⇒ Fig. ⇒ [4](#) , ⇒ [Page 13-7](#) .
- Install front bumper.

⇒ Repair Manual, Body Exterior, Repair Group 63

- Adjust headlights.

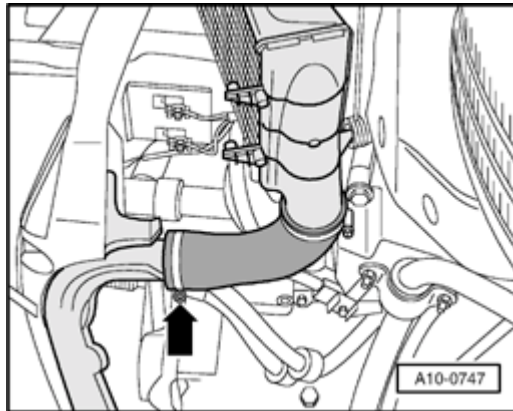
⇒ Repair Manual, Electrical Equipment, Repair Group 94



A

Fig. 1 Remove front sound insulation

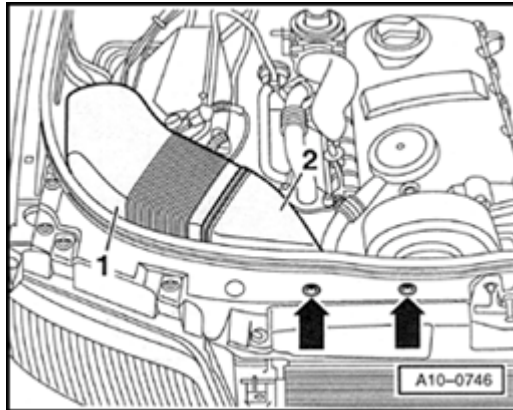
- Remove sound insulation -arrows-.



A

Fig. 2 Remove air duct hose

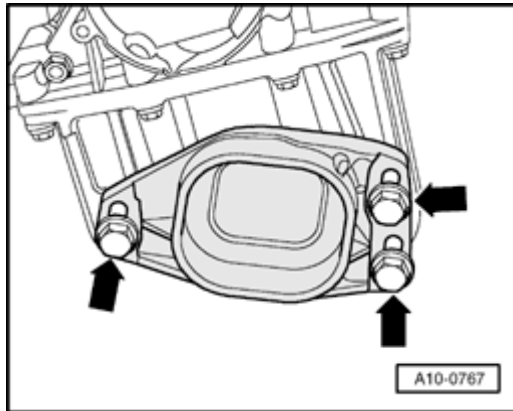
- Remove air duct hose to bottom left charge air cooler from lock carrier - arrow-.



A

Fig. 3 Remove air duct between lock carrier and air filter

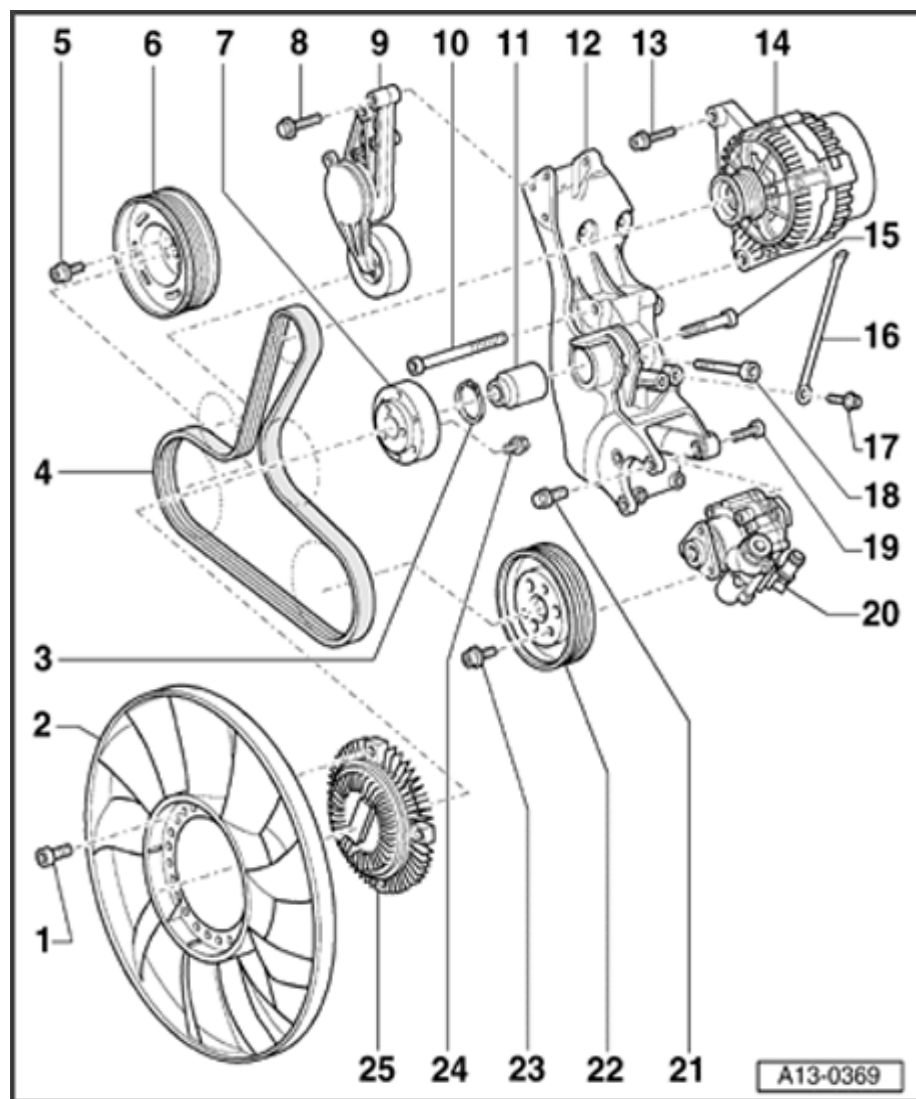
- Remove bolts -arrows-.
- Remove air ducts -1- and -2-.



A

Fig. 4 Adjust stop for torque reaction support

- Attach limit stop for torque reaction support to rest on rubber buffer for torque reaction support under its own weight, and tighten bolts -arrows- to 28 Nm.



Ribbed belt drive for power steering pump, Generator and viscous fan

Note:

Mark the direction of rotation with chalk or felt pen before removing the ribbed belt. If the belt rotates in the wrong direction when it is reinstalled, belt breakage may result. Ensure that the belt is properly seated on the pulleys when installing.

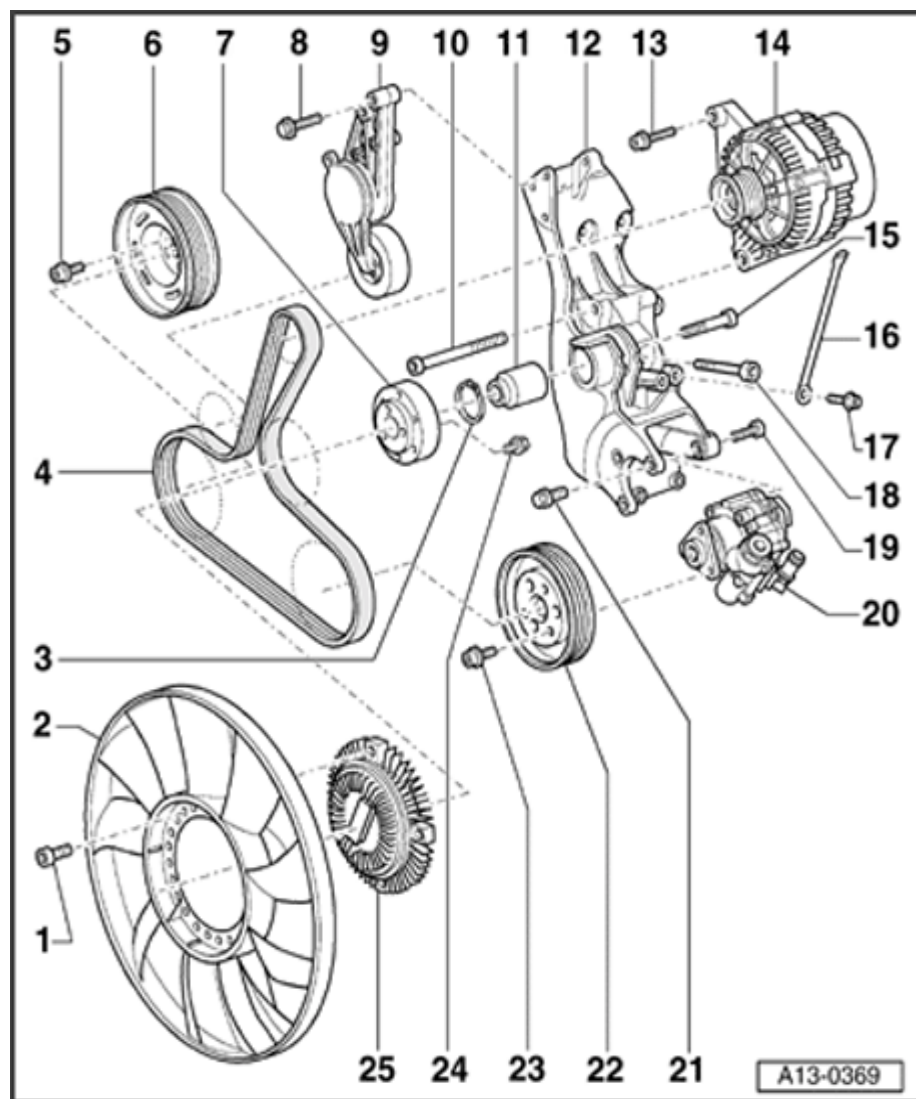
1 - 10 Nm.

2 - Fan wheel

- ◆ For viscous fan
- ◆ Removing and installing ⇒ [Page 13-21](#) .

3 - Circlip

- ◆ For viscous fan bearing
- ◆ Removing and installing ⇒ [Page 13-23](#) .



4 - Ribbed V-belt

- ◆ Removing and installing ⇒ [Page 13-18](#) .
- ◆ Check for wear
- ◆ Routing of ribbed belt ⇒ Fig. ⇒ [2](#) , ⇒ [Page 13-17](#)

5 - Bolt (special type)

- ◆ Always replace
- ◆ Use only genuine bolts

⇒ *Parts List*

- ◆ Torque: 10 Nm + 90° (1/4 turn)

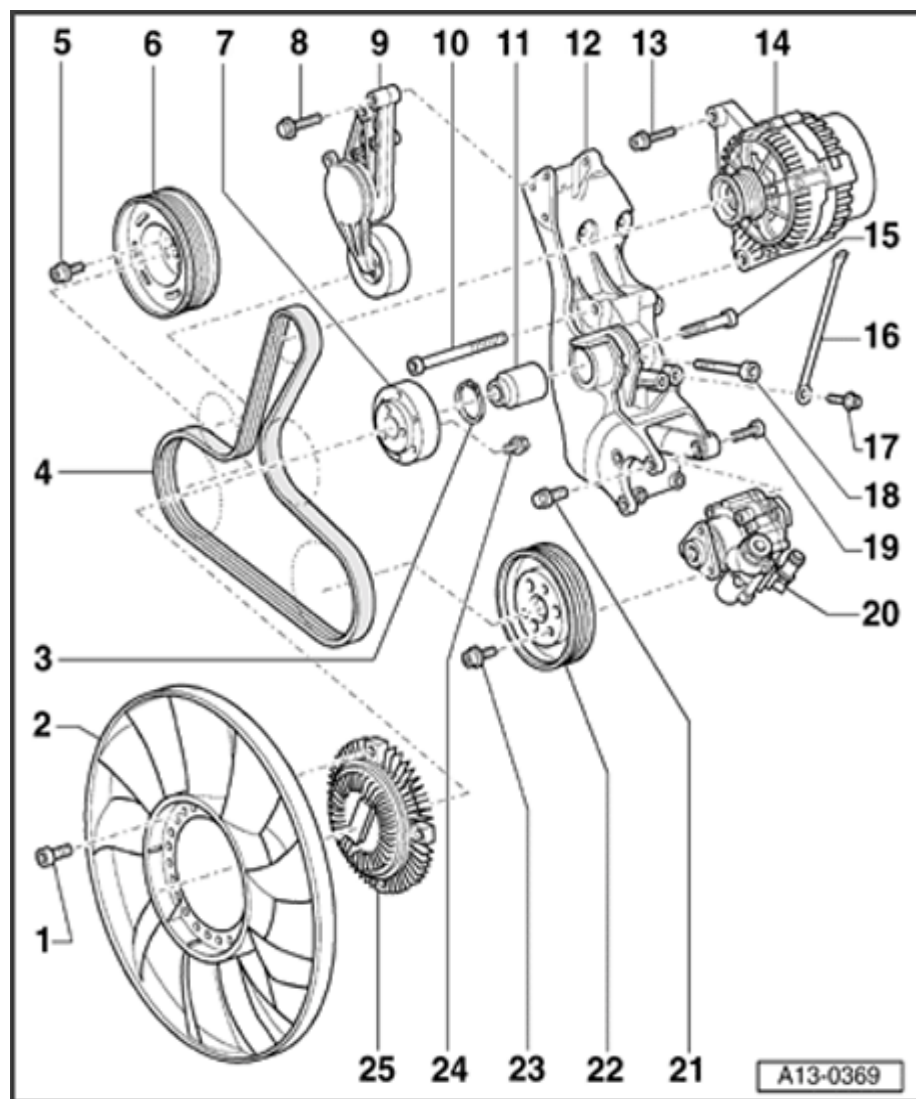
6 - Vibration damper

- ◆ With pulley for ribbed belt
- ◆ Can only be installed in one position ⇒ Fig. ⇒ [1](#) , ⇒ [Page 13-17](#)

7 - Pulley

- ◆ For viscous fan
- ◆ Removing and installing ⇒ [Page 13-21](#) .

13-10

**8 - 23 Nm****9 - Tensioner for ribbed belt**

- ◆ Turn with open end spanner to loosen ribbed belt ⇒ [Page 13-18](#) .
- ◆ Hold in position by inserting a suitable pin or Allen key in holes.

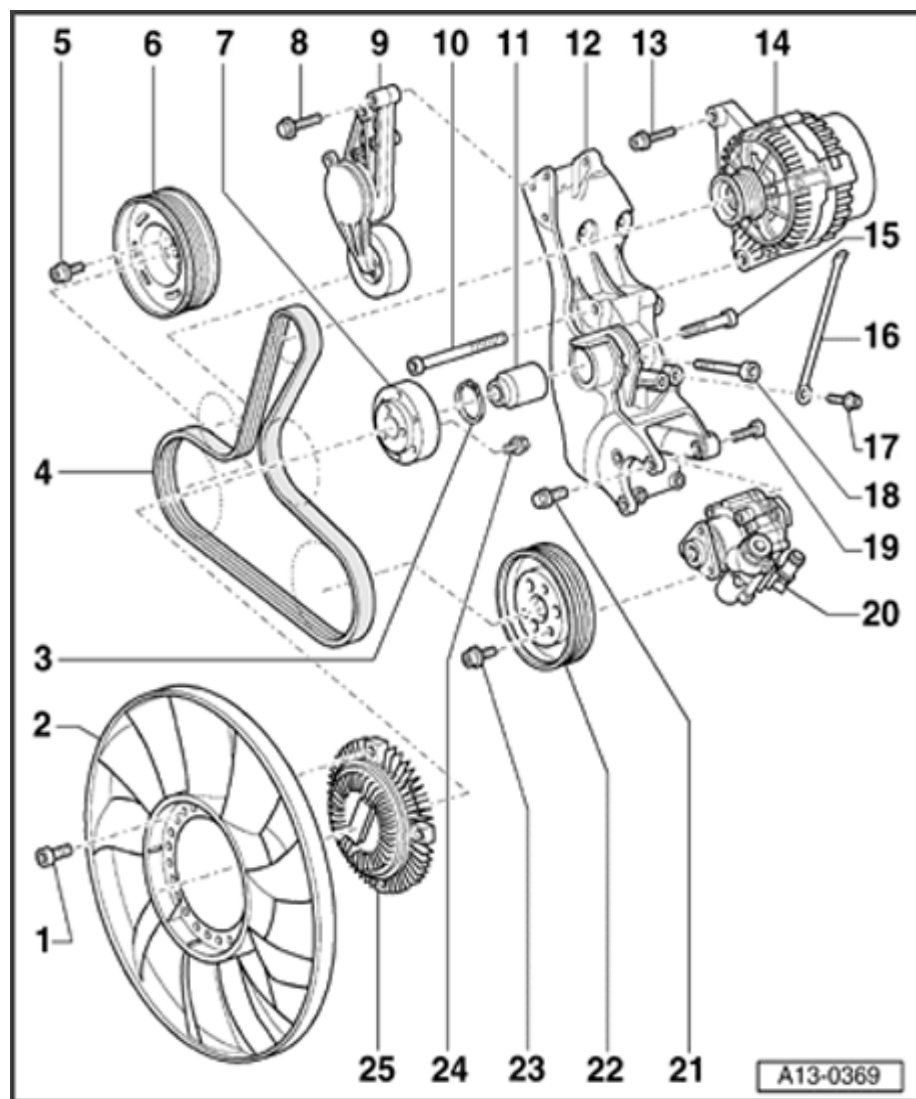
10 - 46 Nm**11 - Mounting**

- ◆ For viscous fan
- ◆ Removing and installing ⇒ [Page 13-23](#) .

12 - Bracket

- ◆ For Generator, power steering pump and viscous fan
- ◆ Removing and installing ⇒ [Page 13-28](#) .

13 - 23 Nm



14 - Generator

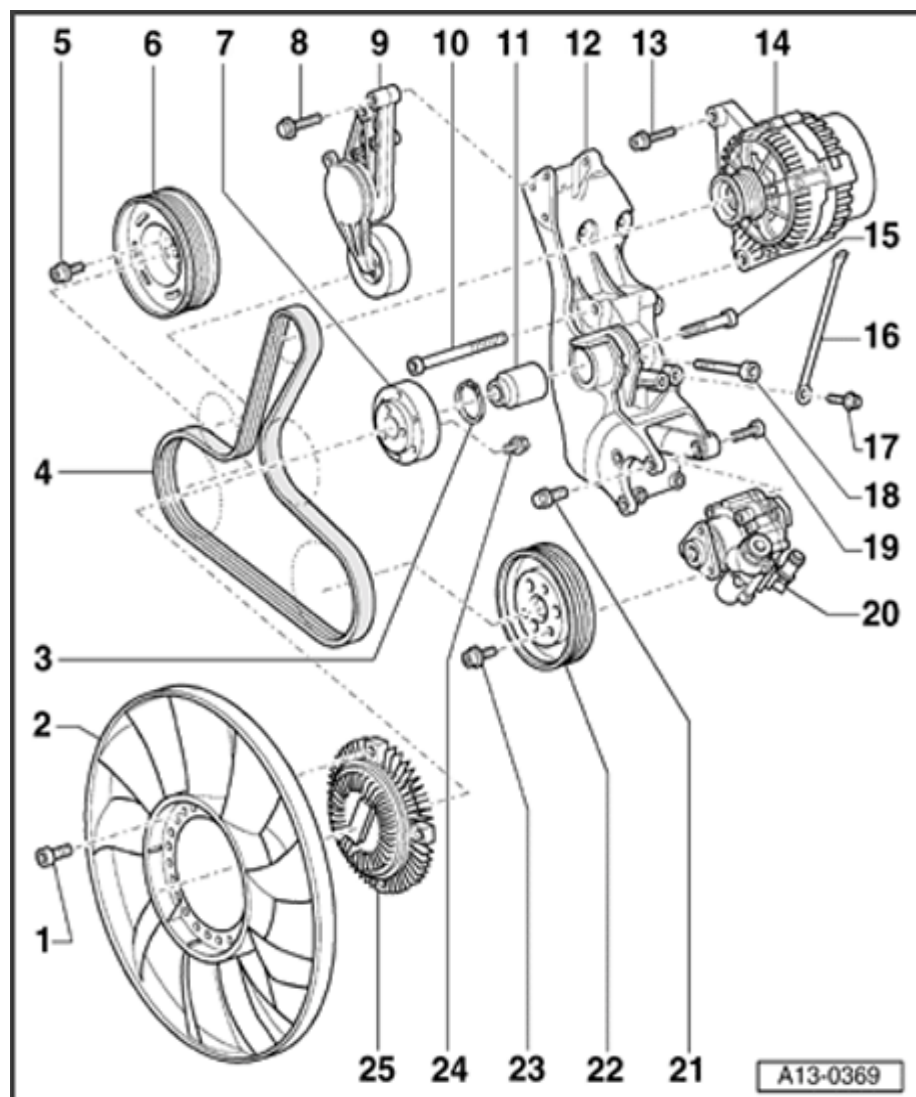
◆ Removing:

- Disconnect battery Ground strap
- Remove air duct hose to charge air cooler.
- Loosen ribbed belt and take belt off Generator ⇒ [Page 13-18](#) .
- Remove viscous fan and put into radiator cowl.
- Remove electrical wiring from Generator.
- Loosen connections for Generator from top and bottom and remove Generator.

◆ Installing:

- To facilitate attachment of Generator slightly drive back thread bushing for securing bolt at bracket.

13-12



15 - 45 Nm

16 - Support

◆ For intake manifold

17 - 20 Nm

18 - 52 Nm

◆ Apply D 000 600 when installing

◆ Bolts have different lengths. For positions and tightening sequence ⇒ [Page 13-33](#)

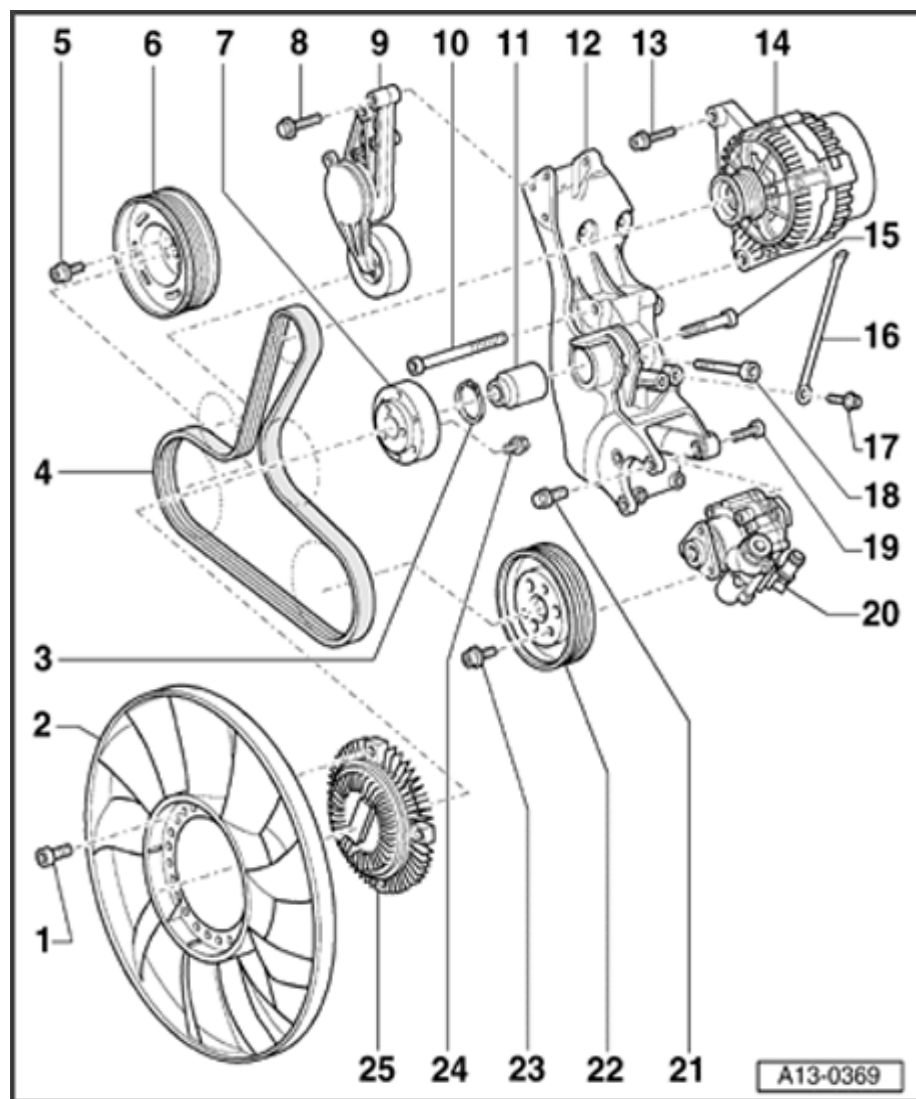
19 - 23 Nm

20 - Power steering pump

◆ Removing and installing:

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 48](#)

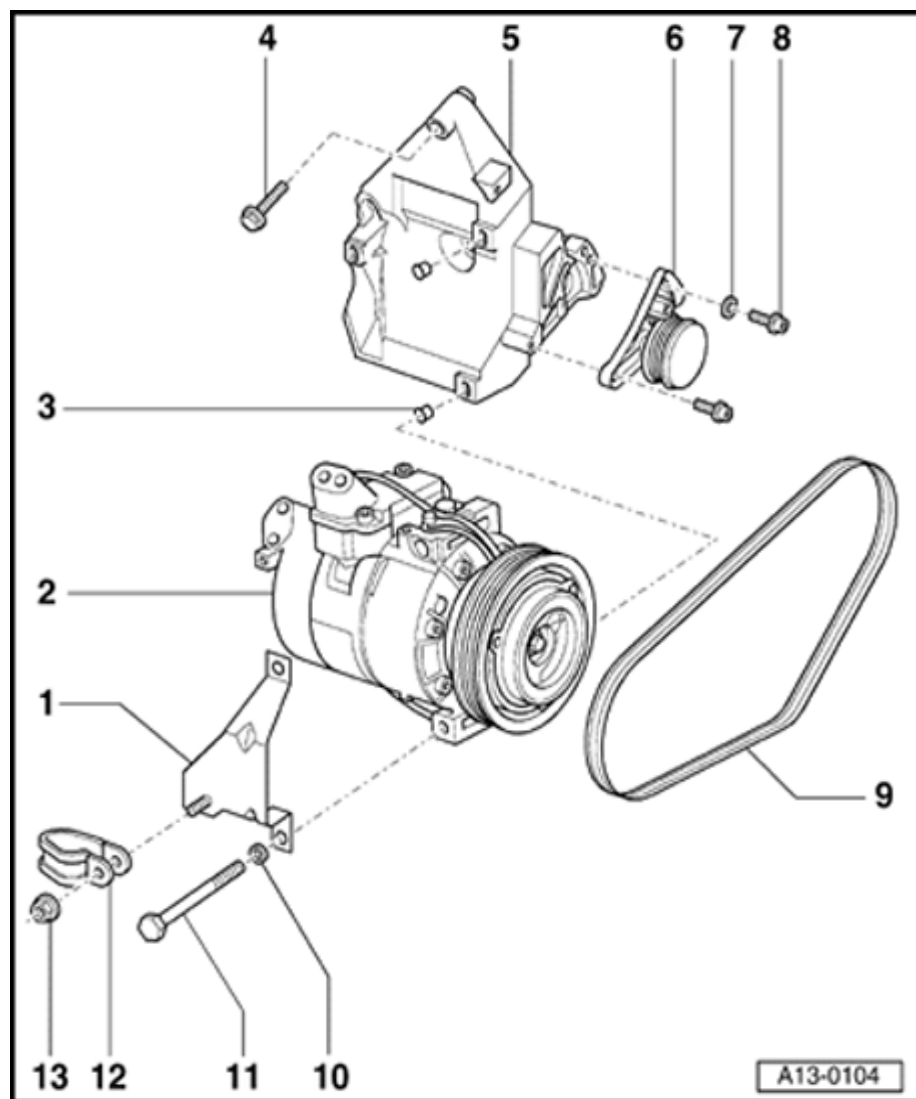
21 - 23 Nm

**22 - Pulley**

- ◆ For power steering pump
- ◆ Installation position: Open side faces to front of vehicle

23 - 23 Nm**24 - Ribbed bolt - 28 Nm****25 - Viscous coupling**

- ◆ Removing and installing ⇒ [Page 13-21](#)



Ribbed belt drive for air conditioner - assembly overview

CAUTION!

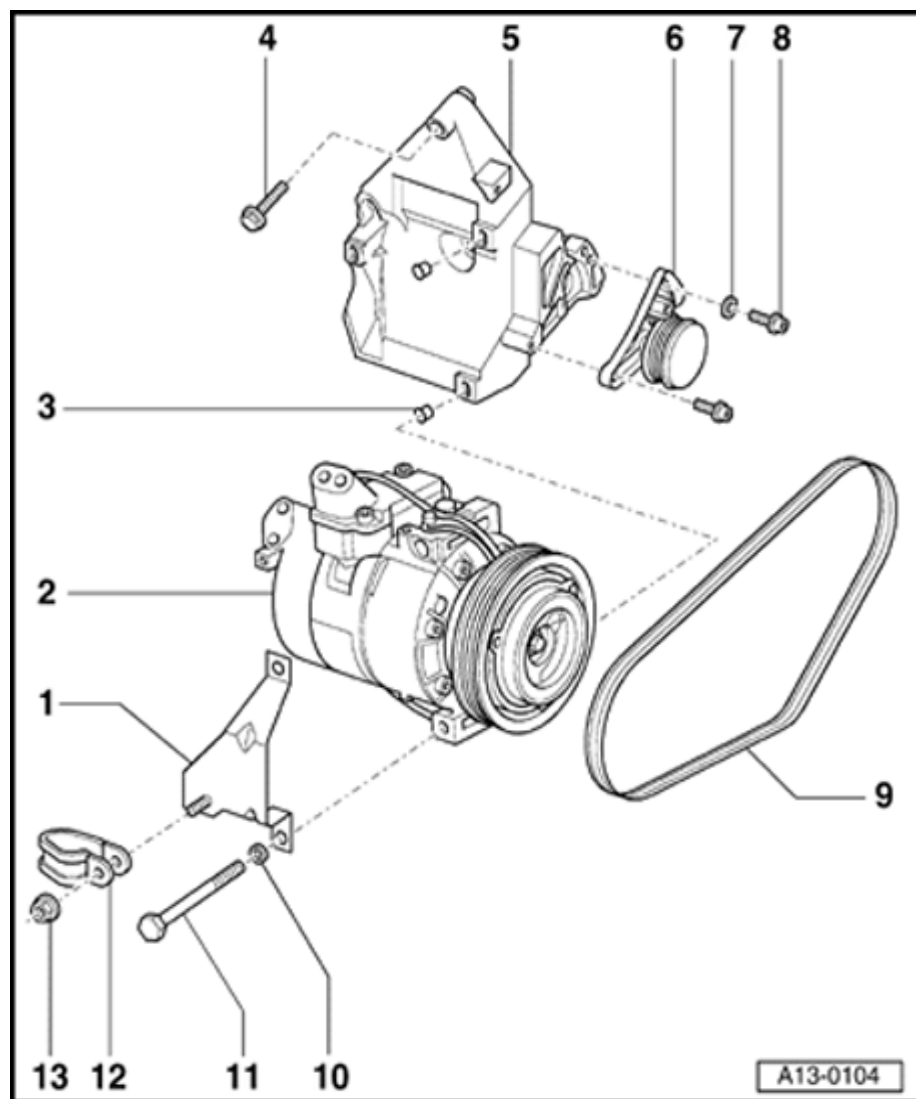
The air conditioner refrigerant circuit must not be opened.

Note:

Mark the direction of rotation with chalk or felt pen before removing the ribbed belt. If the belt rotates in the wrong direction when it is reinstalled, belt breakage may result. Ensure that the belt is properly seated on the pulleys when installing.

1 - Bracket

13-15



2 - Air conditioner compressor

- ◆ Do not loosen or disconnect refrigerant hoses or lines.
- ◆ After removing compressor from mountings, secure to chassis side member with wire or similar. Do not leave compressor suspended on refrigerant hoses.

3 - Dowel sleeve

- ◆ Check sleeve is correctly seated in bracket

4 - 33 Nm

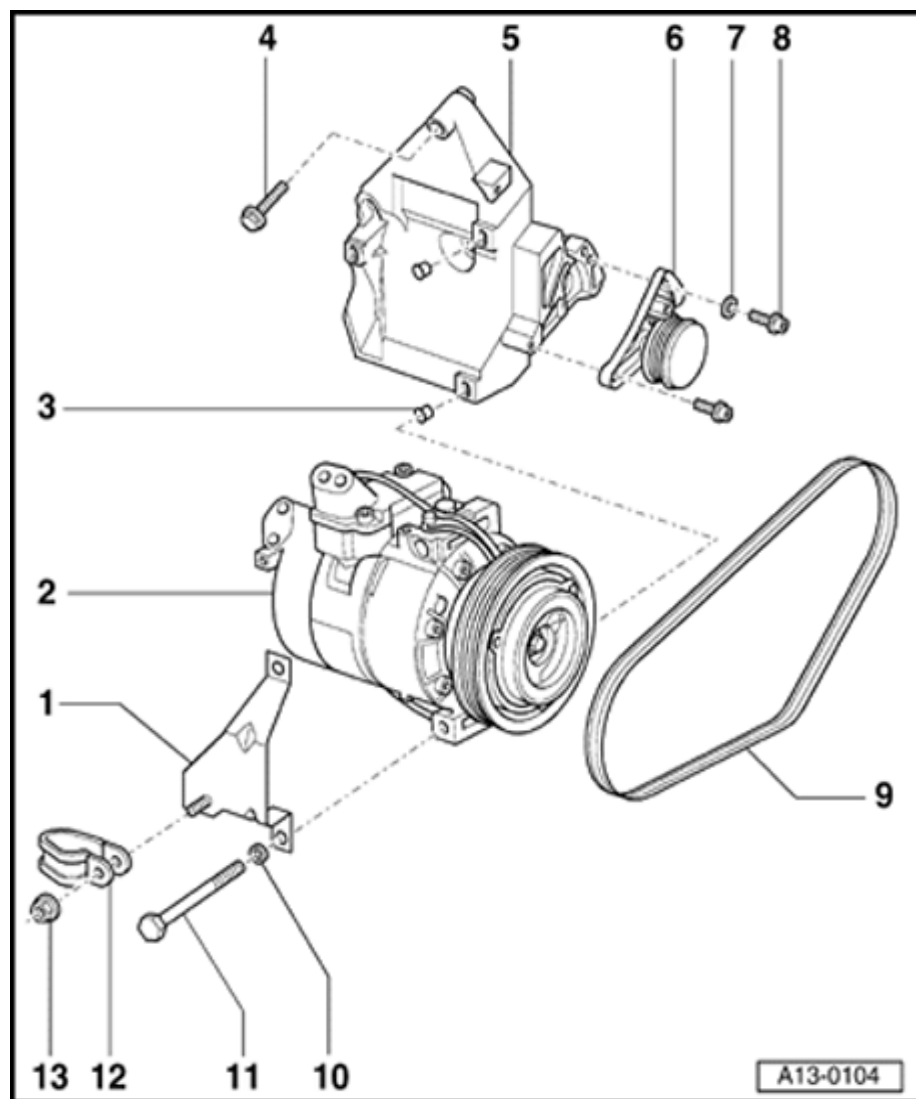
5 - Bracket

- ◆ For A/C compressor

6 - Tensioner

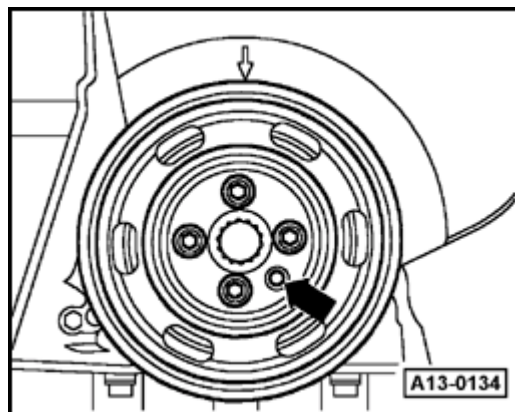
- ◆ For ribbed belt
- ◆ Removing and installing ribbed belt ⇒ [Page 13-18](#)

13-16

**7 - Washer****8 - 23 Nm****9 - Ribbed V-belt**

- ◆ Removing and installing ⇒ [Page 13-18](#) .
- ◆ Check for wear
- ◆ Do not kink
- ◆ Routing of ribbed belt⇒Fig. ⇒ [2](#) , ⇒ [Page 13-17](#)

10 - Washer**11 - 25 Nm****12 - Retaining clip****13 - 20 Nm**



A

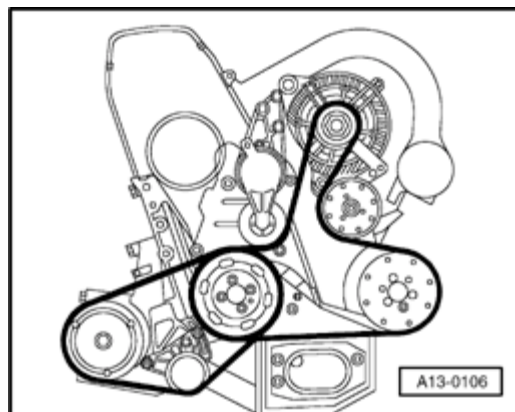
Fig. 1 Installing vibration damper

- Lock carrier must be in service position ⇒ [Page 13-1](#) .
- Ribbed belt must be removed ⇒ [Page 13-18](#) .
- Always replace bolts. Only use original type bolts to install the vibration damper.

⇒ *Parts List*

The vibration damper can only be installed in one position. The hole - arrow- in the vibration damper must fit over the projection on the toothed belt sprocket.

- Tighten bolts of vibration damper to 10 Nm + 90° ($\frac{1}{4}$ turn).



A

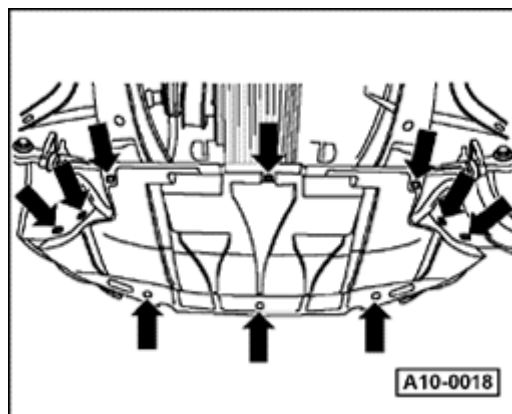
Fig. 2 Ribbed belt routing

Ribbed belt, removing and installing

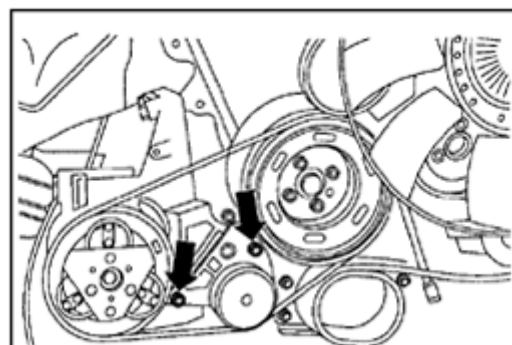
Note:

Mark the direction of rotation with chalk or felt pen before removing the ribbed belt. If the belt rotates in the wrong direction when it is refitted, belt breakage may result. Ensure that the belt is properly seated on the pulleys when installing.

Removing

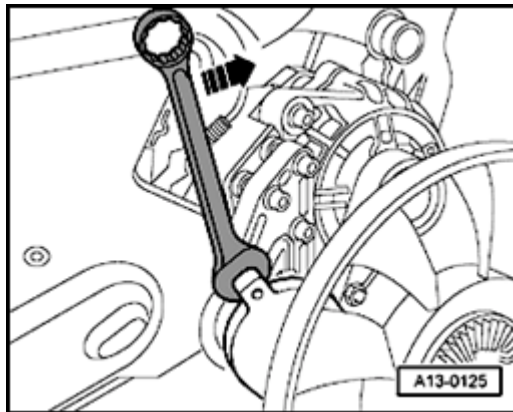
**A**

- Remove sound insulation -arrows-.

**A**

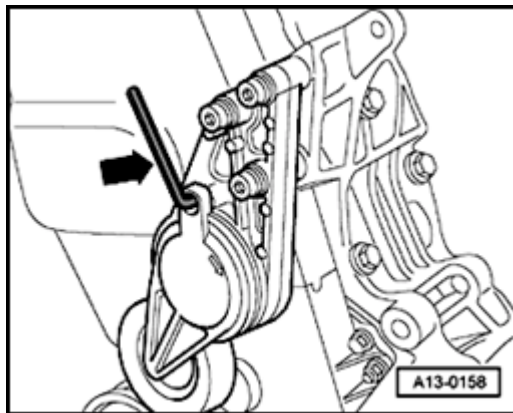
- Loosen bolts securing ribbed belt tensioning roller for A/C compressor - arrows-.

13-19



A

- Turn tensioner in direction of arrow to loosen ribbed belt.
- Remove ribbed belt from Generator and release tensioner.

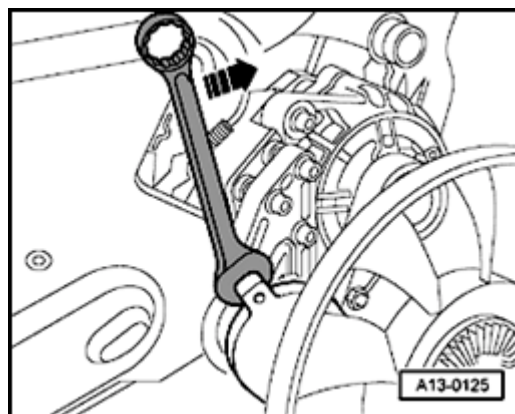
Note:

A

When the lock carrier is in the service position, the ribbed belt tensioner can be secured to prevent it from turning by inserting a suitable pin or Allen key -arrow- into the holes.

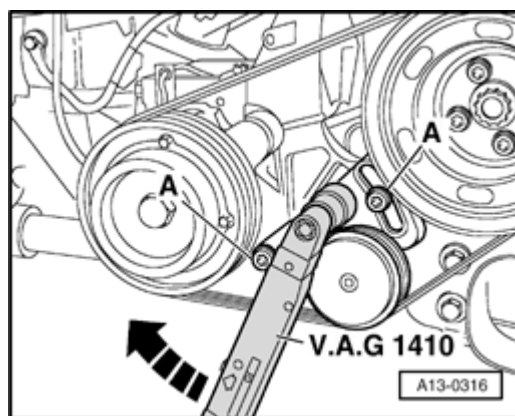
Installing

- Attach ribbed belt to pulleys from crankshaft and vane pump and, if necessary, pull up with auxiliary tool.



- Swivel tensioner for ribbed belt in direction of arrow.
- Install ribbed belt over Generator pulley last. Release tensioner.
- Check that ribbed belt is properly seated.
- Fit ribbed belt for A/C compressor.

◆ Ribbed belt routing ⇒ Fig. ⇒ [2](#) , ⇒ [Page 13-17](#)

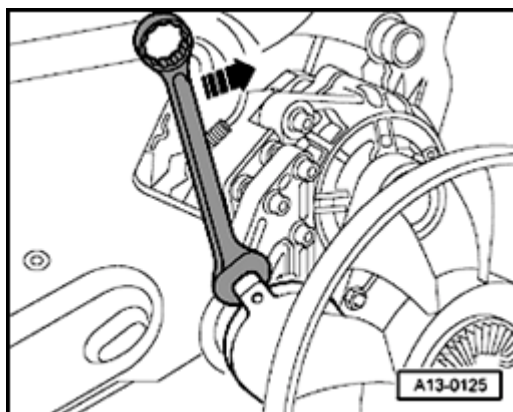


- Attach torque wrench at "7 o'clock position" as illustrated to hex on tensioner and pretension to 30 Nm.
- While tensioning, tighten bolts -A- to 23 Nm.
- Start engine and check belt running.

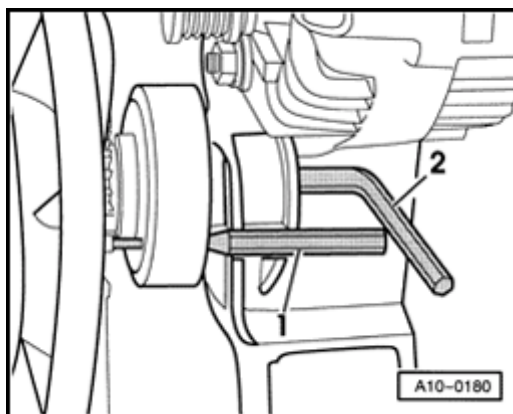
Viscous fan, removing and installing

Removing

- Lock carrier must be in service position ⇒ [Page 13-1](#) .



- A - To loosen ribbed belt, turn tensioner in direction of arrow.
- Remove ribbed belt from Generator pulley.



- A - Secure pulley for viscous fan with pin punch -1- and remove using Allen key -2-.
- Remove viscous fan.

Installing

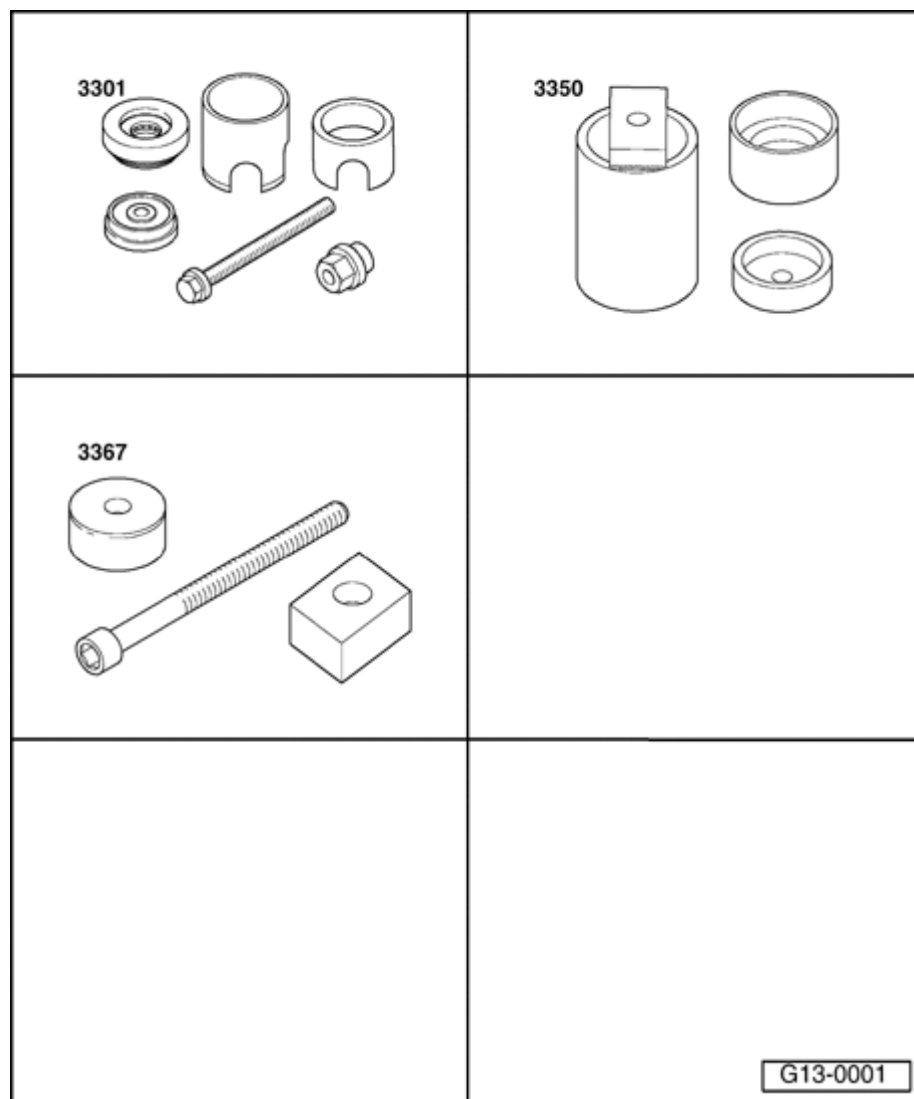
Installation is carried out in the reverse order of removal; note the following:

- Install ribbed belt ⇒ [Page 13-20](#) .
- Install lock carrier ⇒ [Page 13-1](#) .

Tightening torque

Component	Nm
Viscous fan to bearing	45

13-23



Bearing for viscous fan, removing and installing

Special tools and equipment

- ◆ Special tool 3301
- ◆ Special tool 3350
- ◆ Special tool 3367

Removing

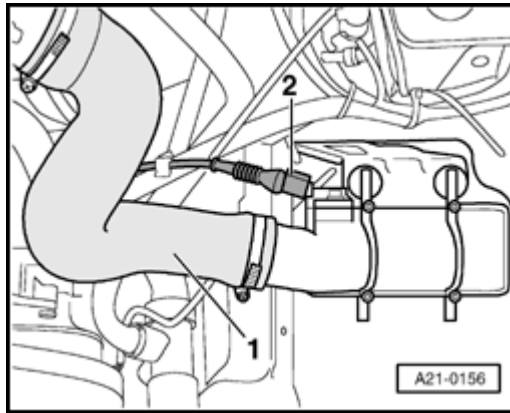
- Lock carrier must be in service position ⇒ [Page 13-1](#) .



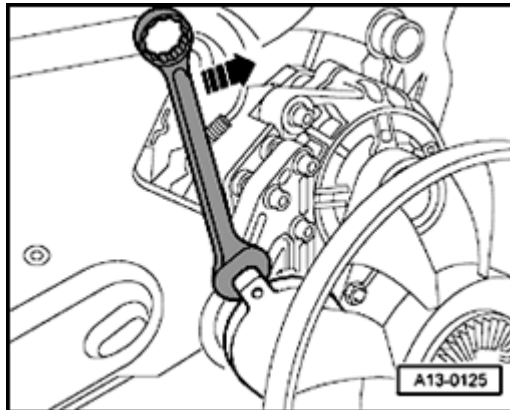
- Remove air duct hose -1-.

Note:

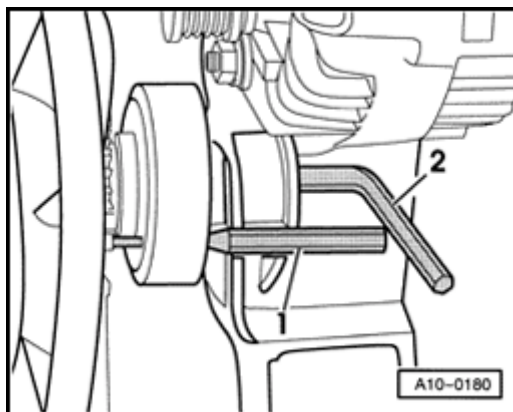
Connector -2- remains plugged in.



- Turn tensioner in direction of arrow to loosen ribbed belt.
- Remove ribbed belt from Generator pulley.

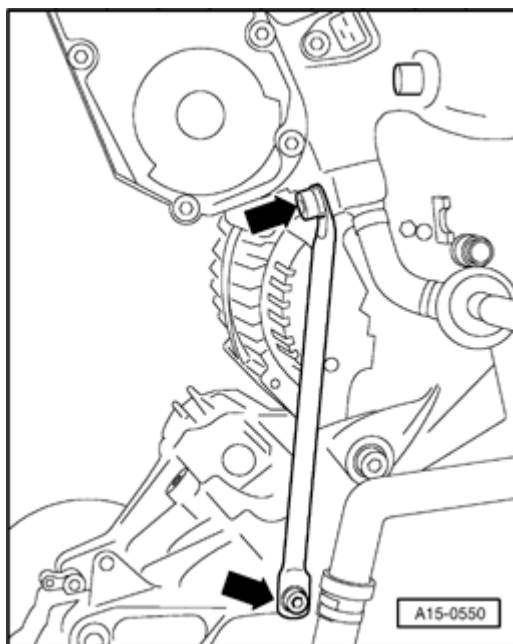


13-25



A

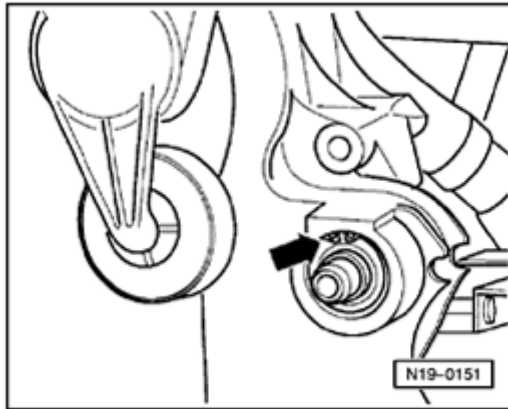
- Secure pulley for viscous fan with pin punch -1- and remove using Allen key -2-.
- Remove viscous fan from mounting.



A

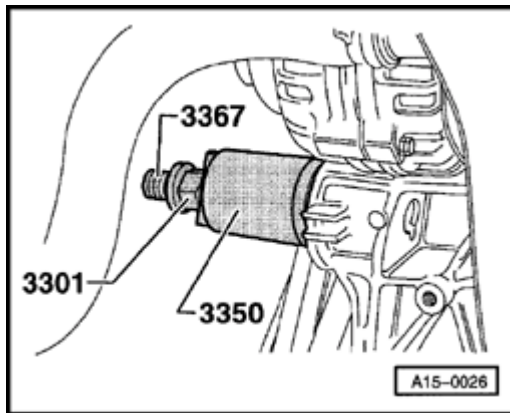
- Remove intake pipe support -arrows-.

13-26



A

- Remove circlip -arrow- from bearing bushing using angled circlip pliers.



A

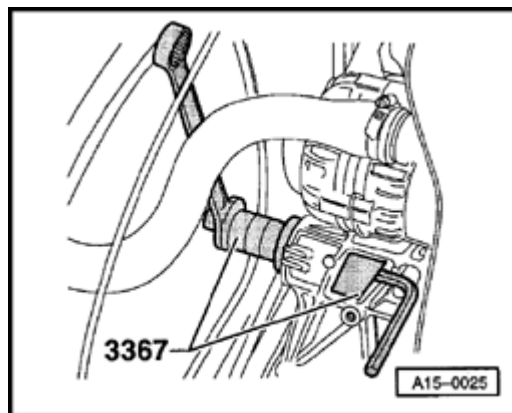
- Remove bearing from housing with nut from assembly mounting 3301, bolt 3367/3 and pipe 3350.

Installing

Installation is carried out in the reverse order;
note the following:

A

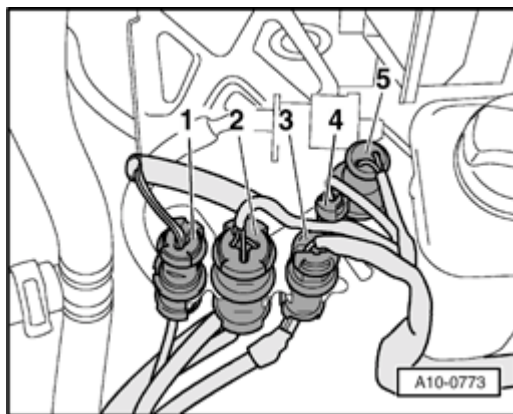
- Press in bearing with tool 3367 and nut from assembly mounting 3301.
- Install circlip in housing for viscous fan using angled circlip pliers.
- Install viscous fan ⇒ [Page 13-21](#) .



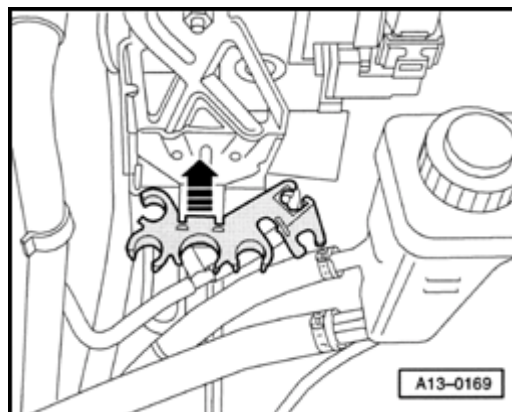
Bracket for Generator, power steering pump and viscous fan, removing and installing

Removing

- Observe or obtain radio anti-theft code on vehicles with coded radio.
- Disconnect Ground strap at battery with ignition switched off.
- Remove cover from power steering fluid reservoir.
- Mark connectors -1 to 5- and remove from bracket.

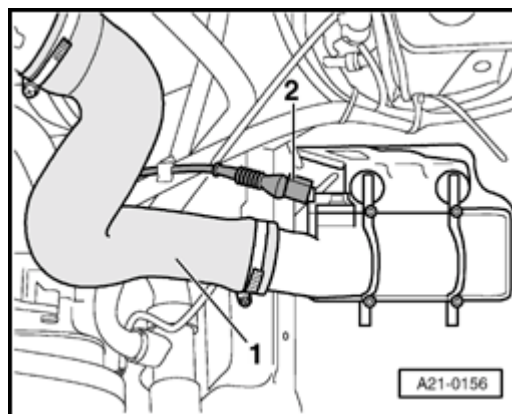


13-29



A

- Unclip connector bracket at ABS unit console and lift up to remove.



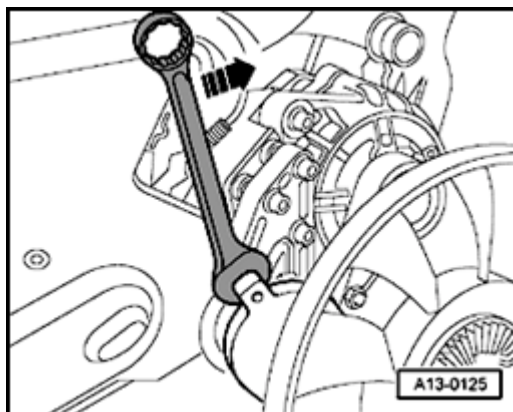
A

- Remove air duct hose -1-.

Note:

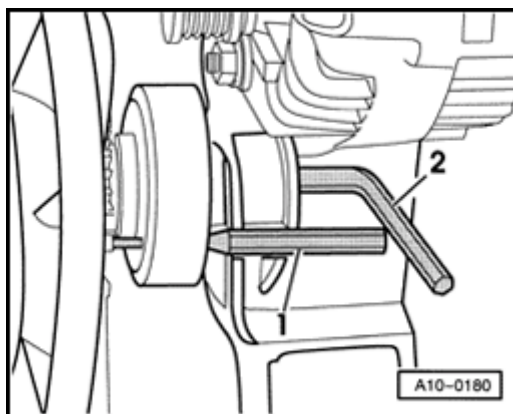
Connector -2- remains plugged in.

13-30



A

- To loosen ribbed belt, turn tensioner in direction of arrow.
- Remove ribbed belt from Generator pulley.

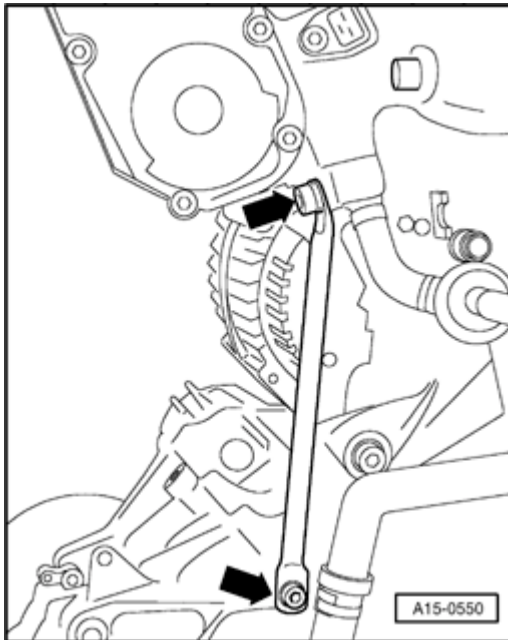


A

- Secure pulley for viscous fan with pin punch -1- and remove using Allen key -2-.
- Remove viscous fan from mounting and put in front of radiator cowl.
- Remove wiring from rear of Generator.
- Loosen connections for Generator from top and bottom and remove Generator.

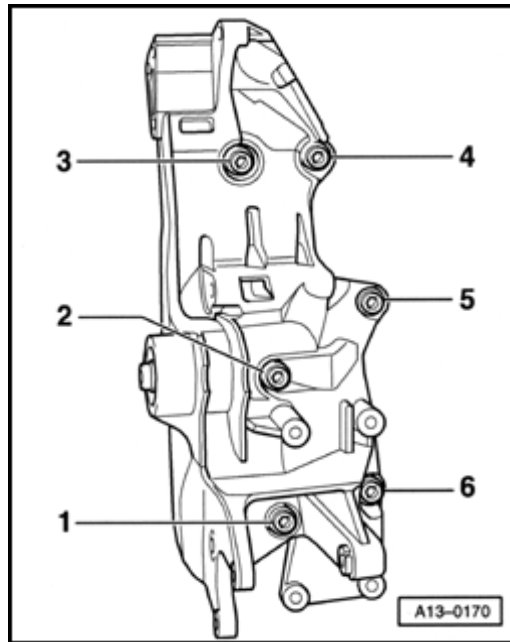
13-31

- Remove tensioner for ribbed belt from bracket.
- Remove pulley from power steering pump.
- Unbolt power steering pump, move clear to one side and tie in place. Do not open hydraulic connections.
- Remove intake pipe support -arrows-.



A

13-32

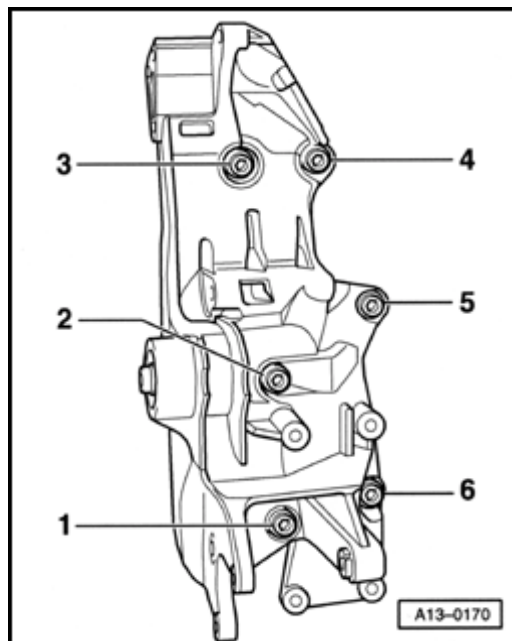


A

- Unbolt bracket for Generator, steering pump and viscous fan -bolts 1 to 6-.

Installing

Installation is carried out in the reverse order of removal; note the following:



4

- Install bolts -1 to 6- with locking fluid "D 000 600" and tighten bolts diagonally.
 - 1, 2 - Bolt M10 x 85
 - 3 to 6 - Bolt M10 x 45
 - To help install Generator knock back bushing on bottom securing bolt slightly.
 - Remove viscous fan ⇒ [Page 13-21](#) .
 - Install ribbed belt ⇒ [Page 13-20](#) .
 - After connecting battery, enter anti-theft code for radio.
- ⇒ *Radio operating instructions*
- Close windows fully using window switches.

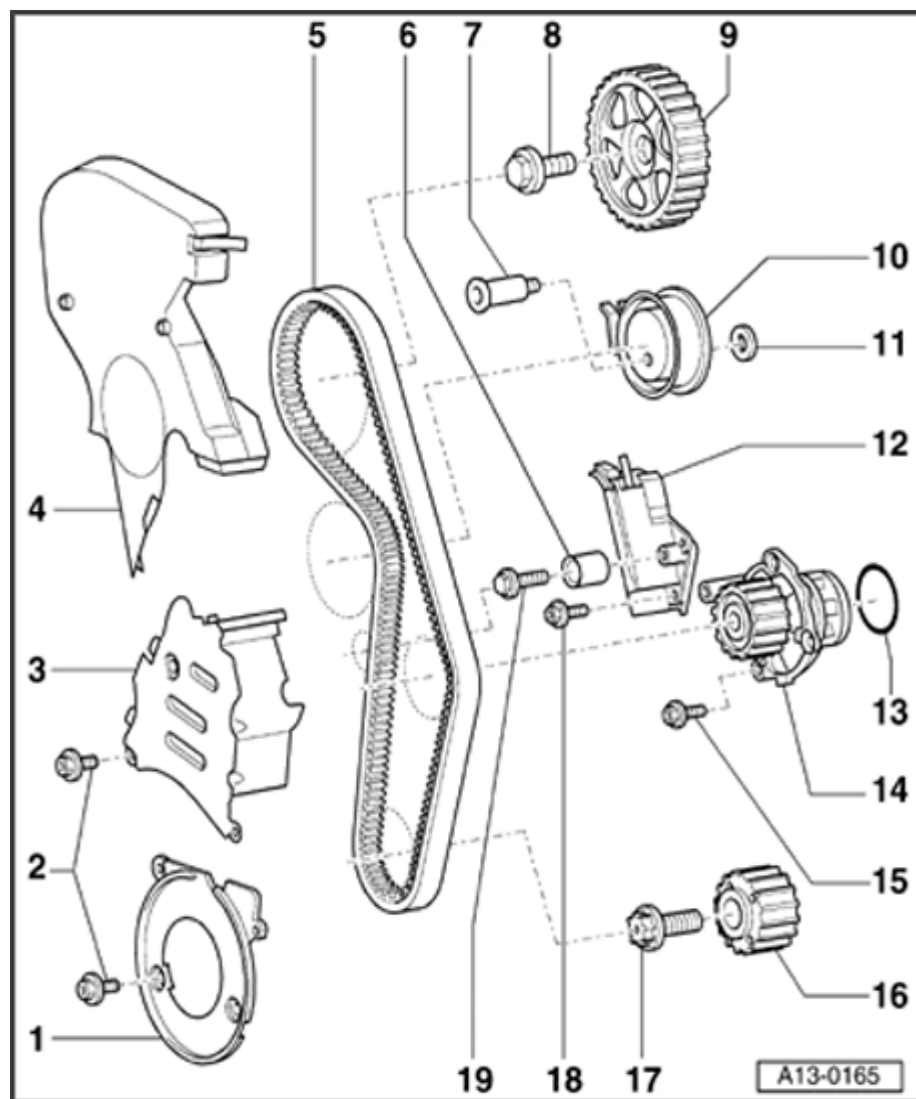
- Actuate all window switches again for at least one second in the "close" direction to activate the automatic open/close function.
- Set clock to correct time.

Tightening torques

Component		Nm
Bracket for Generator, power steering pump and viscous fan to cylinder block		52 1)
Support for intake manifold		
	to intake manifold	20
	to bracket	20
Power steering pump to bracket		23
Pulley to coolant pump		23
Generator at bracket		
	M8	23
	M10	46
Ribbed belt tensioner to bracket		23

Viscous fan to bearing	45

- 1) Install with locking fluid D 000 600 A2



Toothed belt drive

Note:

Mark the direction of rotation with chalk or felt pen before removing the toothed belt. If the belt rotates in the wrong direction when it is reinstalled, belt breakage may result.

1 - Toothed belt guard - lower

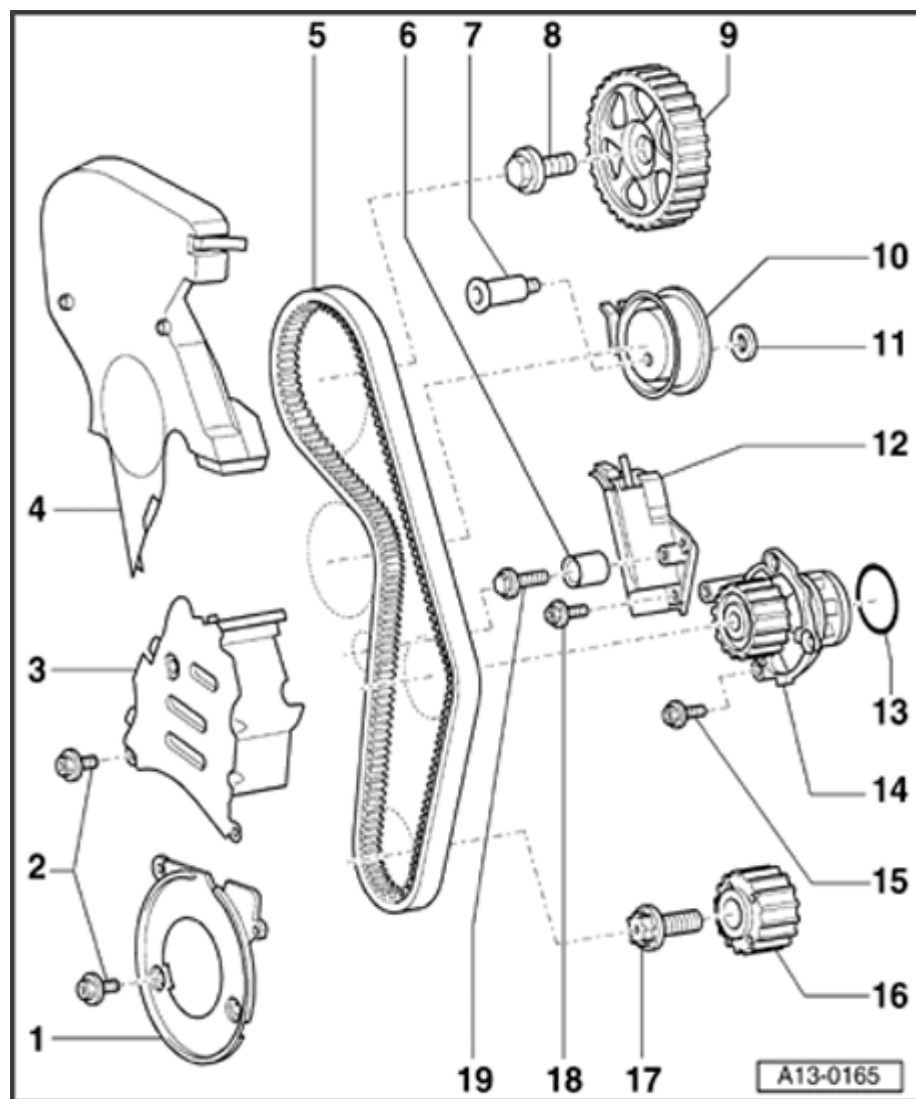
- ◆ To remove, unbolt vibration damper

2 - 10 Nm

- ◆ Apply D 000 600 when installing

3 - Toothed belt guard - center

- ◆ Unbolt tensioner before removing center section of toothed belt guard



4 - Toothed belt guard - top

- ◆ When installing, engage carefully in center toothed belt guard

5 - Toothed belt

- ◆ Mark direction of rotation with chalk or felt pen before removing.
- ◆ Check for wear
- ◆ Removing ⇒ [Page 13-40](#)
- ◆ Install (adjust valve timing) ⇒ [Page 13-44](#)

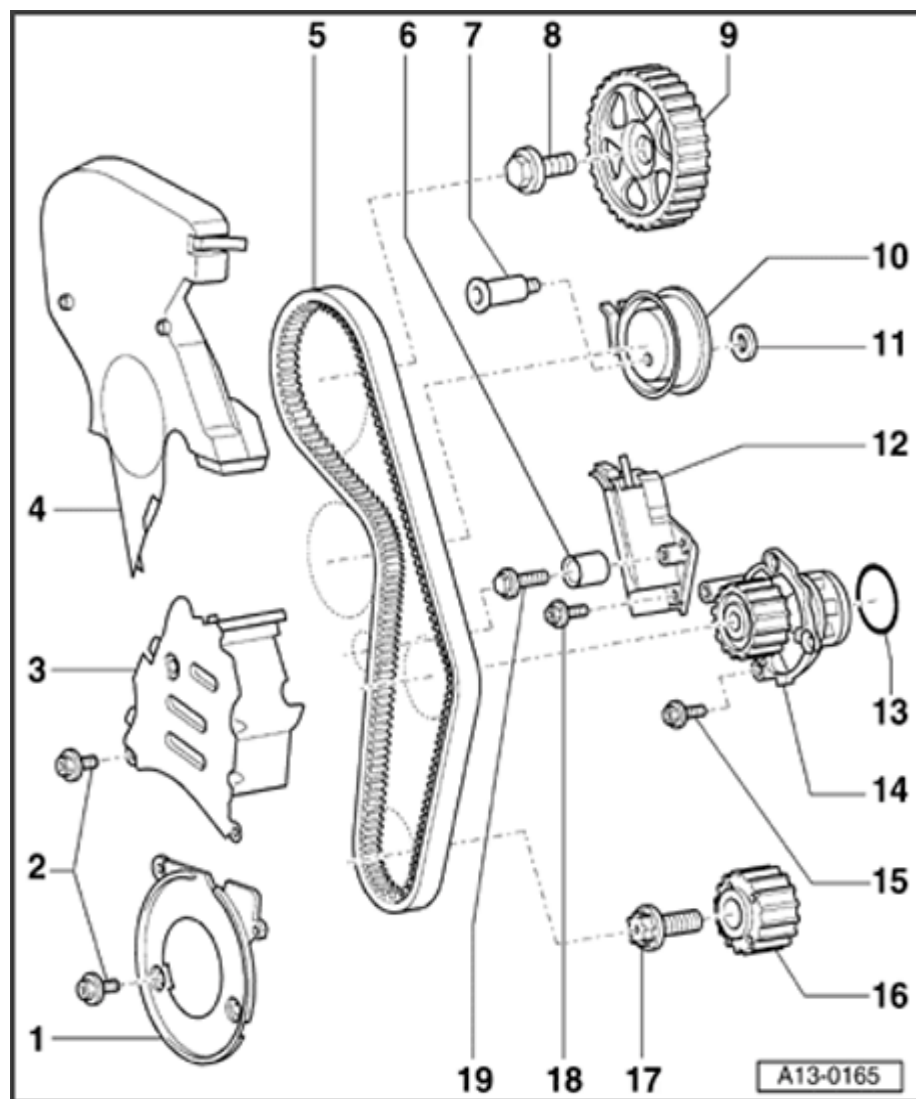
6 - Idler roller

7 - 27 Nm

8 - 65 Nm

- ◆ Counter hold with 3036 to loosen and tighten

13-37

**9 - Camshaft sprocket**

- ◆ For exhaust camshaft
- ◆ Take off toothed belt before removing and installing ⇒ [Page 13-40](#)
- ◆ Installation position ⇒ Fig. ⇒ [1](#) , ⇒ [Page 13-39](#)

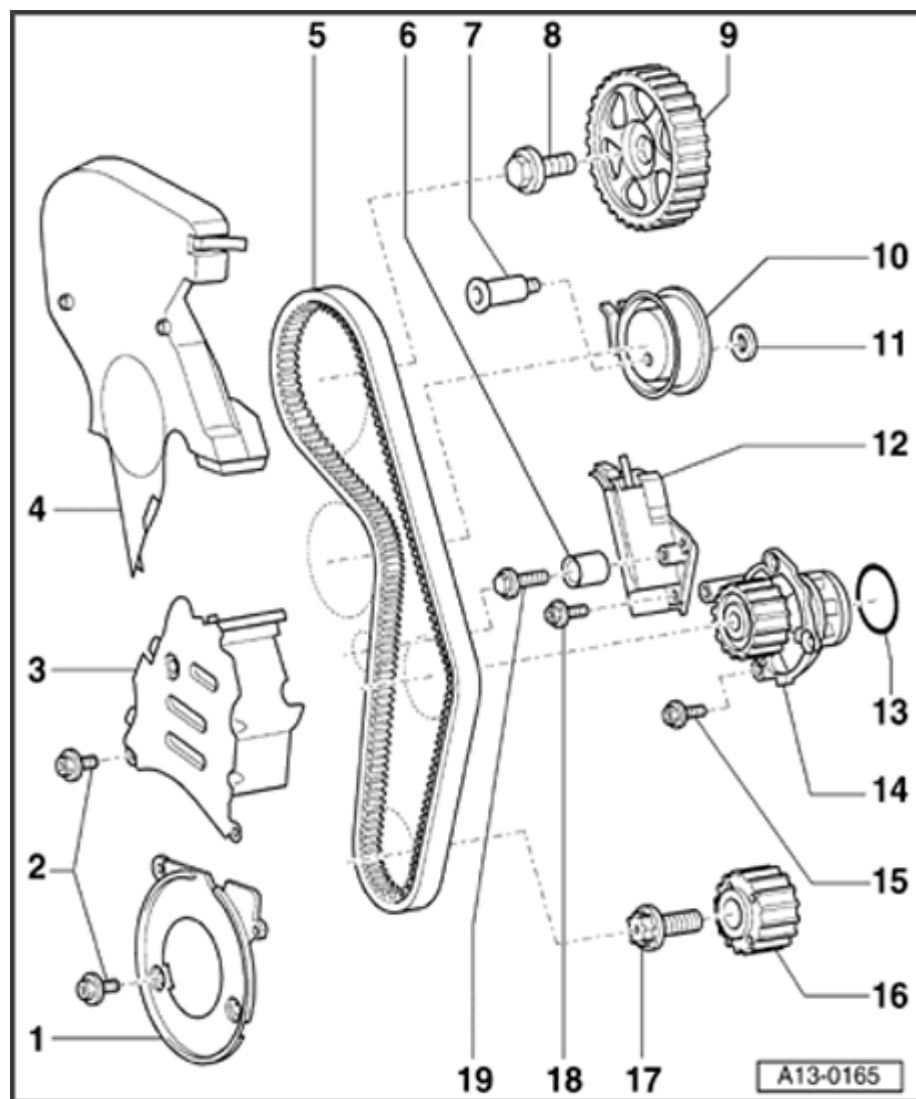
10 - Tensioner**11 - Washer****12 - Tensioner for toothed belt****13 - O-ring**

- ◆ Always replace
- ◆ Lightly coat with coolant G 012 A8 D before installing

14 - Coolant pump

- ◆ Removing and installing ⇒ [Page 19-12](#)

13-38



15 - 15 Nm

16 - Crankshaft sprocket

- ◆ Contact surface between sprocket and crankshaft must be free of oil.
- ◆ Can only be installed in one position.

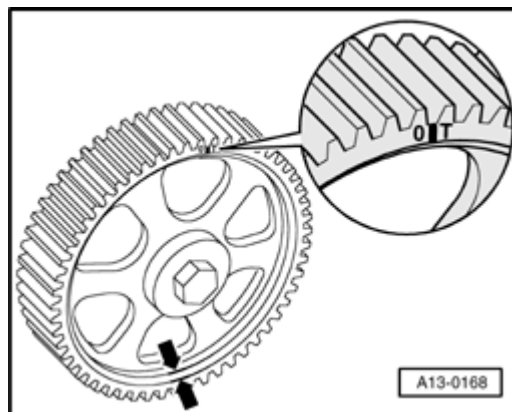
17 - 90 Nm + $\frac{1}{4}$ turn (90°) further

- ◆ Always replace
- ◆ Do not use oil
- ◆ Counter hold with 3415 to loosen and tighten
- ◆ Fasten counterhold 3415 ⇒ Fig. ⇒ [2](#) , ⇒ [Page 13-39](#)

18 - 15 Nm

19 - 25 Nm

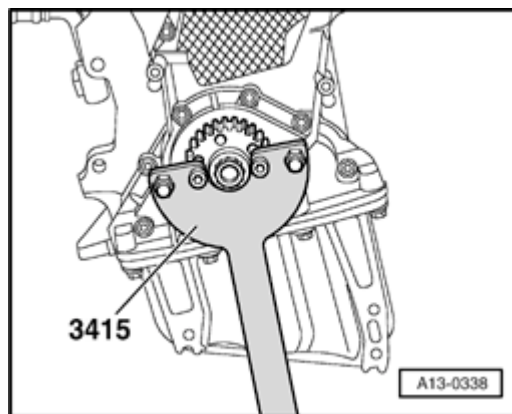
13-39



A

Fig. 1 Location of camshaft sprocket

- ◆ The narrow web of the camshaft sprocket faces outward -arrows- and the marking for TDC of cylinder 1 is visible from front.



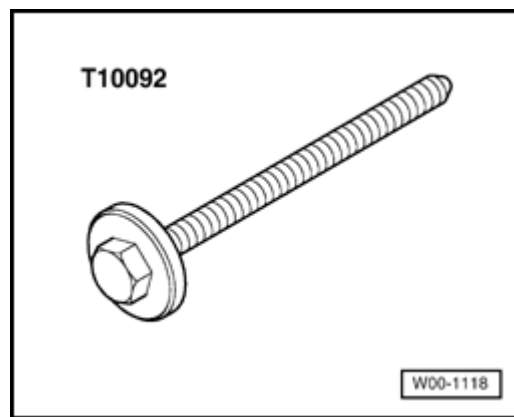
A

Fig. 2 Removing and installing toothed belt crankshaft

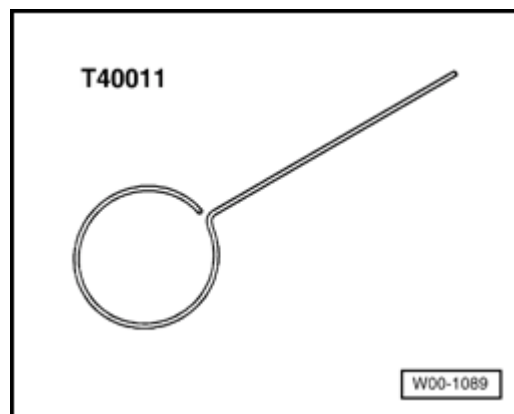
- Use counter-hold tool 3415 to loosen and tighten the central bolt.

Toothed belt, removing and installing

Special tools and equipment



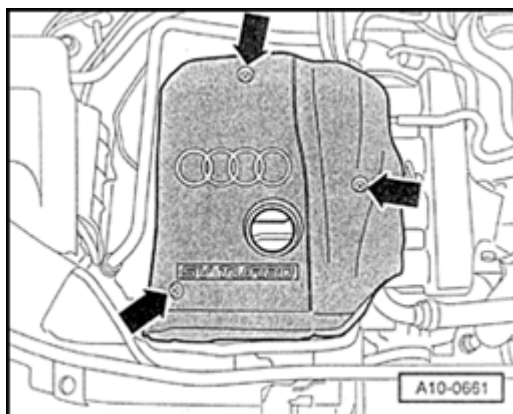
- ◆ Socket head fastener T10092



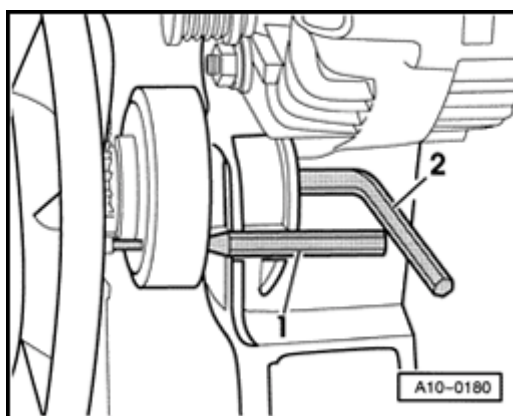
- ◆ Pin T40011

Removing

- Engine in vehicle.
- Lock carrier must be in service position ⇒ [Page 13-1](#) .



- Remove engine cover -arrows-.
- Remove ribbed belt and tensioner for ribbed belt ⇒ [Page 13-18](#) .



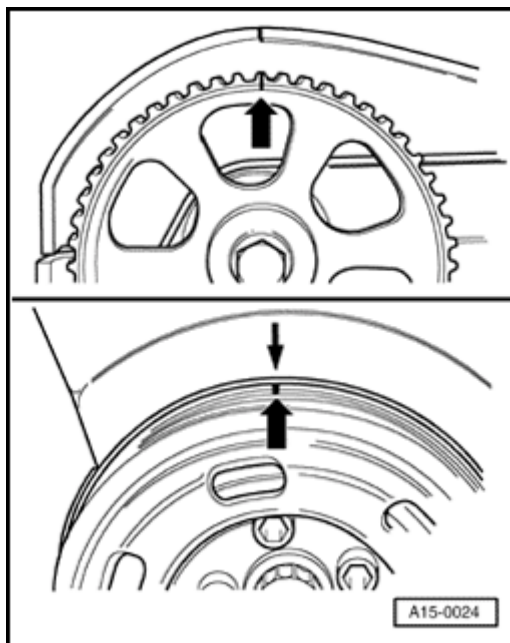
- Secure pulley for viscous fan with pin punch -1- and remove using Allen key -2-.
- Remove viscous fan from mounting.
- Remove upper toothed belt guard.

13-42

- Mark direction of rotation of belt with chalk or felt pen.

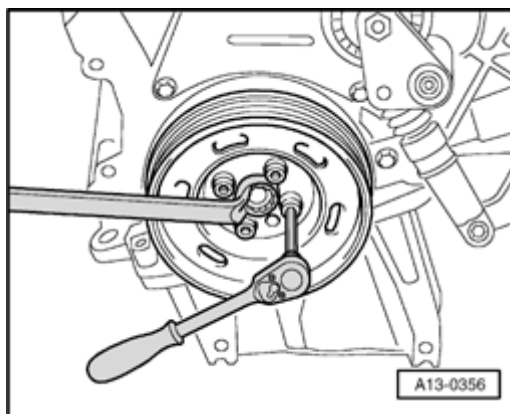
A

- Set crankshaft to markings for TDC of No. 1 cylinder by turning central bolt on crankshaft sprocket in direction of rotation -arrows-.

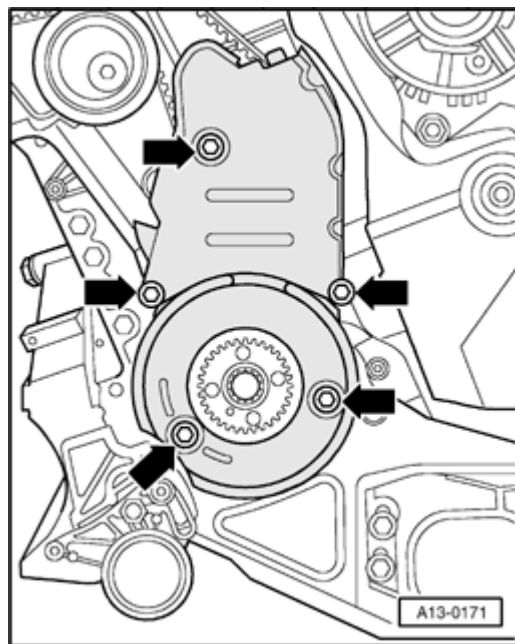


A

- Unbolt vibration damper.

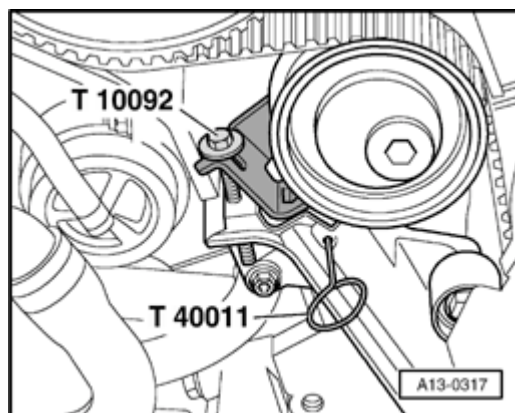


13-43



A

- Unbolt lower and center section of toothed belt guard -arrows-.



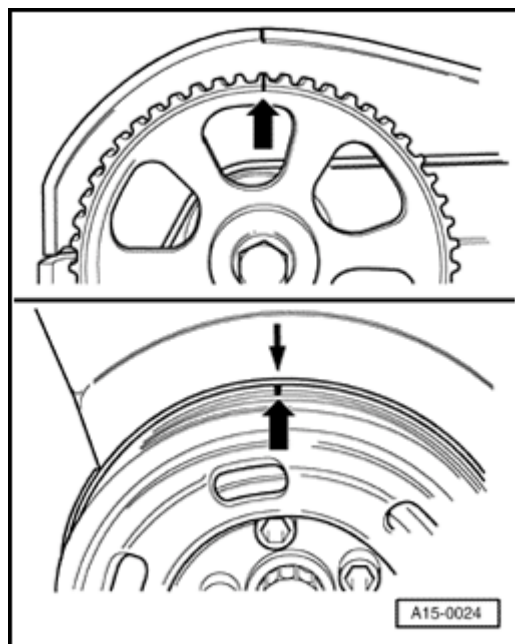
A

- Attach socket head fastener T10092 into the tensioner for toothed belt.
- Only tension pressure piston of tensioner until pressure piston is secured with pin T40011.
- Take off toothed belt.

Installing (adjusting valve timing)

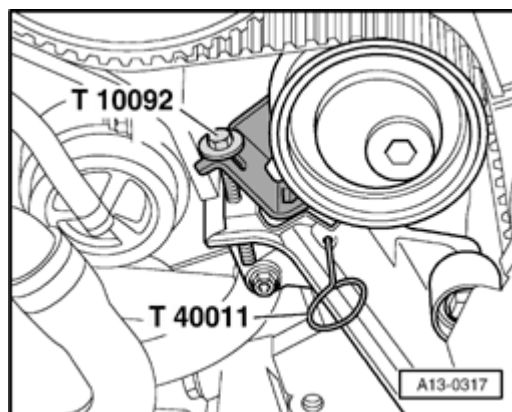
Note:

- ◆ *The position of the toothed belt must be set as described below, even after repairs in which the belt is only taken off the camshaft sprocket.*
- ◆ *When turning the camshaft, the crankshaft must not be at TDC at any cylinder. There is a danger of damage to valves/piston crown.*



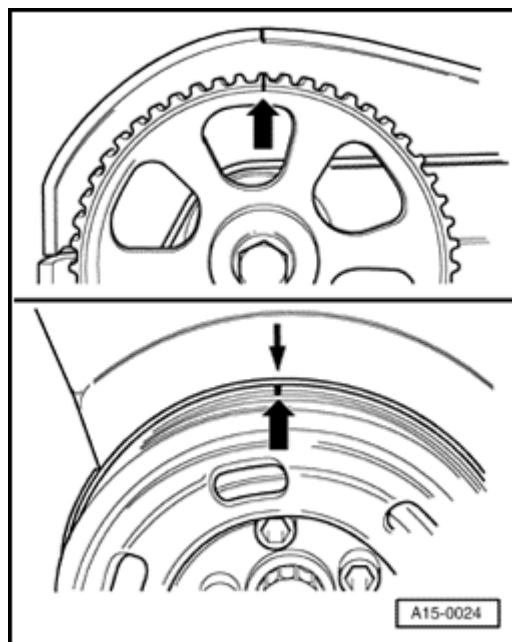
- Align marking on camshaft sprocket with marking at cylinder head cover.
- Place toothed belt on crankshaft sprocket (observe direction of rotation).
- Install toothed belt guard - lower part.
- Secure vibration damper/belt pulley with one bolt (note installation arrangement).
- Set crankshaft to TDC for cylinder No. 1.
- Install toothed belt onto coolant pump, then tensioning roller, and finally camshaft sprocket.

13-45



A

- Unscrew socket head fastener T10092.
- Pull out pin T40011 from tensioner.
 - ◆ The pressure piston of the tensioner for the toothed belt loosens.



A

- Turn crankshaft two full turns in direction of rotation (by turning central bolt on crankshaft sprocket) and check that camshaft and crankshaft marks align with their reference points.
- Install vibration damper/belt pulley.
- Install toothed belt guard (center and top sections).
- Install viscous fan ⇒ [Page 13-21](#) .
- Install ribbed belt and tensioner for ribbed belt ⇒ [Page 13-20](#) .

Tightening torques

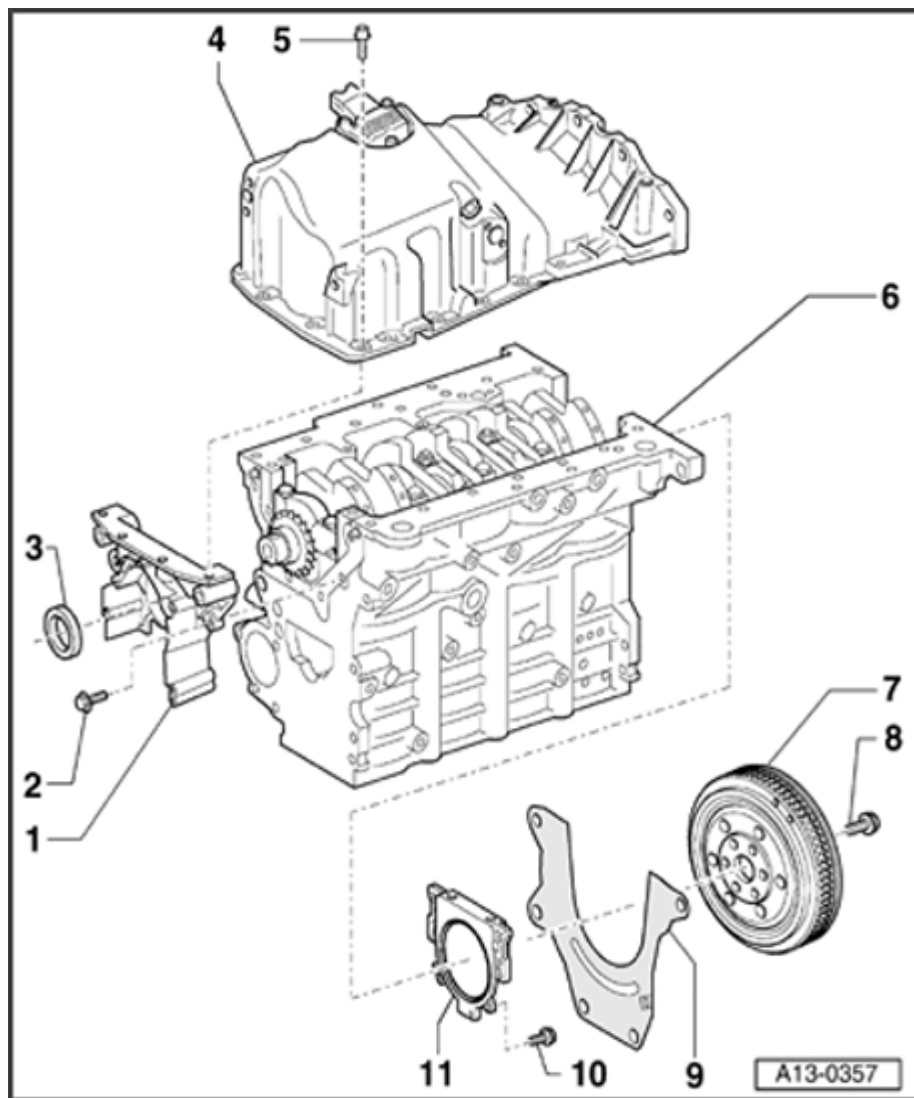
Component	Nm
Lower section of toothed belt guard to cylinder block	10 ¹⁾
Center section of toothed belt guard to cylinder block	10 ¹⁾
Vibration damper/belt pulley to crankshaft	10 + 90 • 2)3)
Ribbed belt tensioner to bracket	23

1) Install with locking fluid D 000 600 A2

2) Replace bolts

3) 90 ° corresponds to a quarter turn

13-47



Sealing flanges and flywheel/drive plate, removing and installing

Note:

For repairs to the clutch:

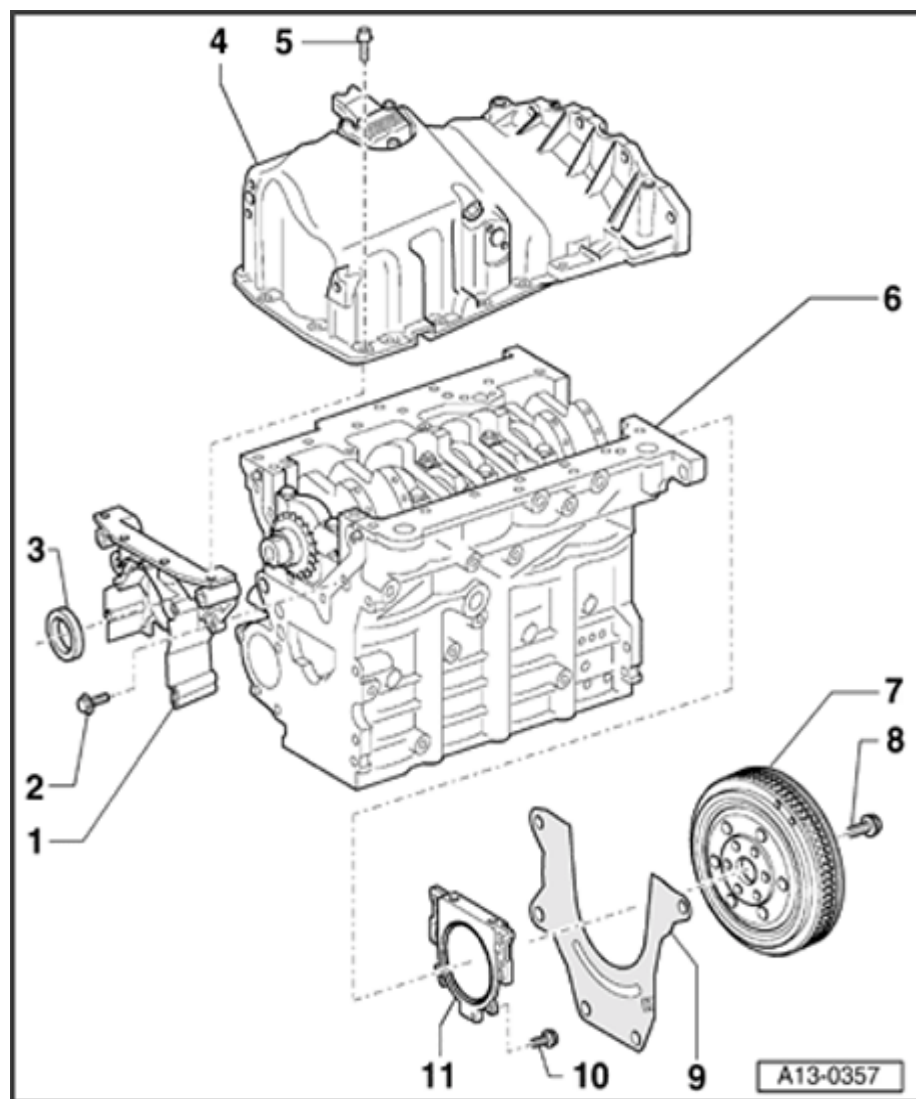
⇒ [Repair Manual, 5 Spd. Manual Transmission 012/01W Front Wheel Drive, Repair Group 30](#)

⇒ [Repair Manual, 5 Spd. Manual Transmission 01A All Wheel Drive, Repair Group 30](#)

1 - Sealing flange - front

- ◆ Must be located on dowel sleeves
- ◆ Removing and installing ⇒ [Page 13-56](#) .

2 - 15 Nm



3 - Sealing ring

- ◆ Replacing ⇒ [Page 13-51](#)
- ◆ Do not oil sealing lip of oil seal

4 - Sump

- ◆ Removing and installing ⇒ [Page 17-11](#)

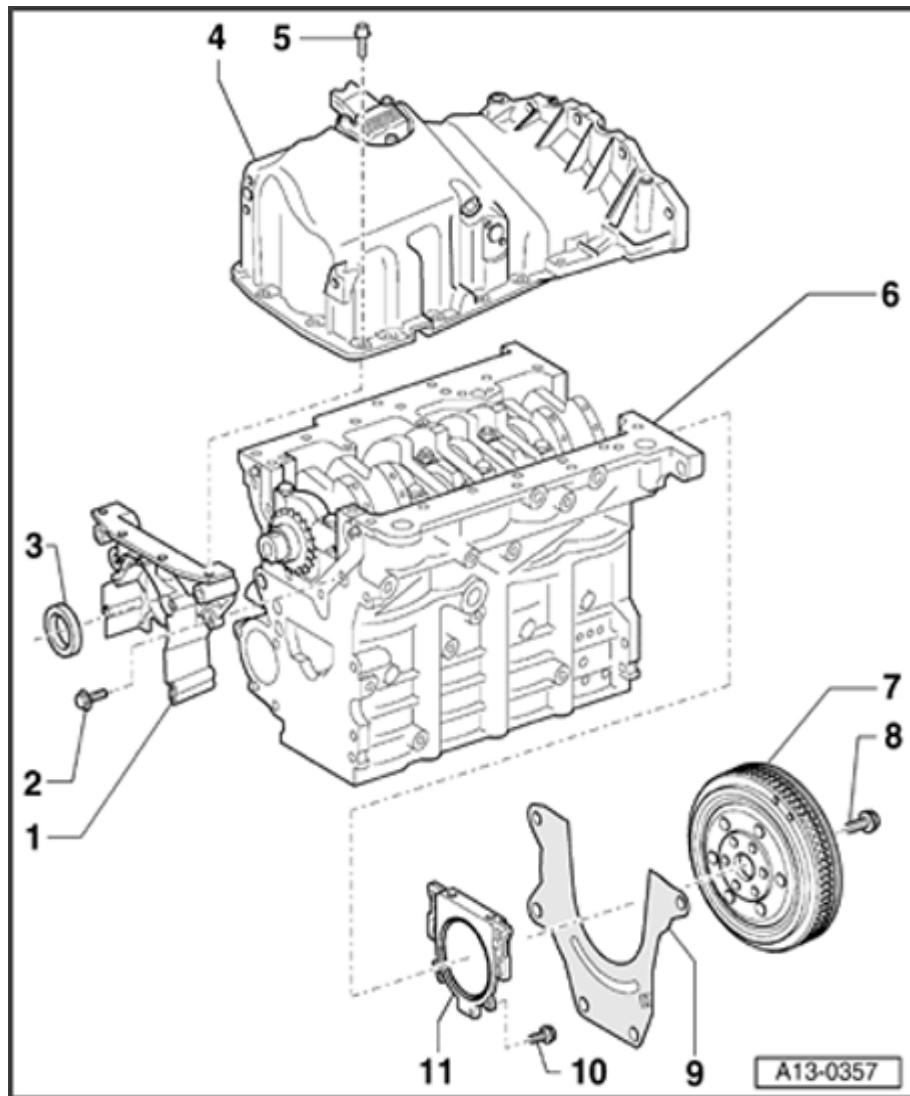
5 - 15 Nm

6 - Cylinder block

- ◆ Removing and installing crankshaft ⇒ [Page 13-67](#) .
- ◆ Dismantling and assembling pistons and conrods ⇒ [Page 13-79](#) .

7 - Dual-mass flywheel/drive plate

- ◆ Removing and installing dual mass flywheel ⇒ [Page 13-62](#)
- ◆ Removing and installing drive plate ⇒ [Page 13-64](#)
- ◆ Can only be installed in one position. Holes are offset.

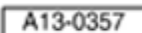


8 - Securing bolt for dual-mass flywheel or drive plate

- ◆ Always replace
- ◆ Tightening torque for dual mass flywheel ⇒ [Page 13-63](#)
- ◆ Tightening torque for drive plate (vehicles with automatic gearbox) ⇒ [Page 13-66](#)

9 - Intermediate plate

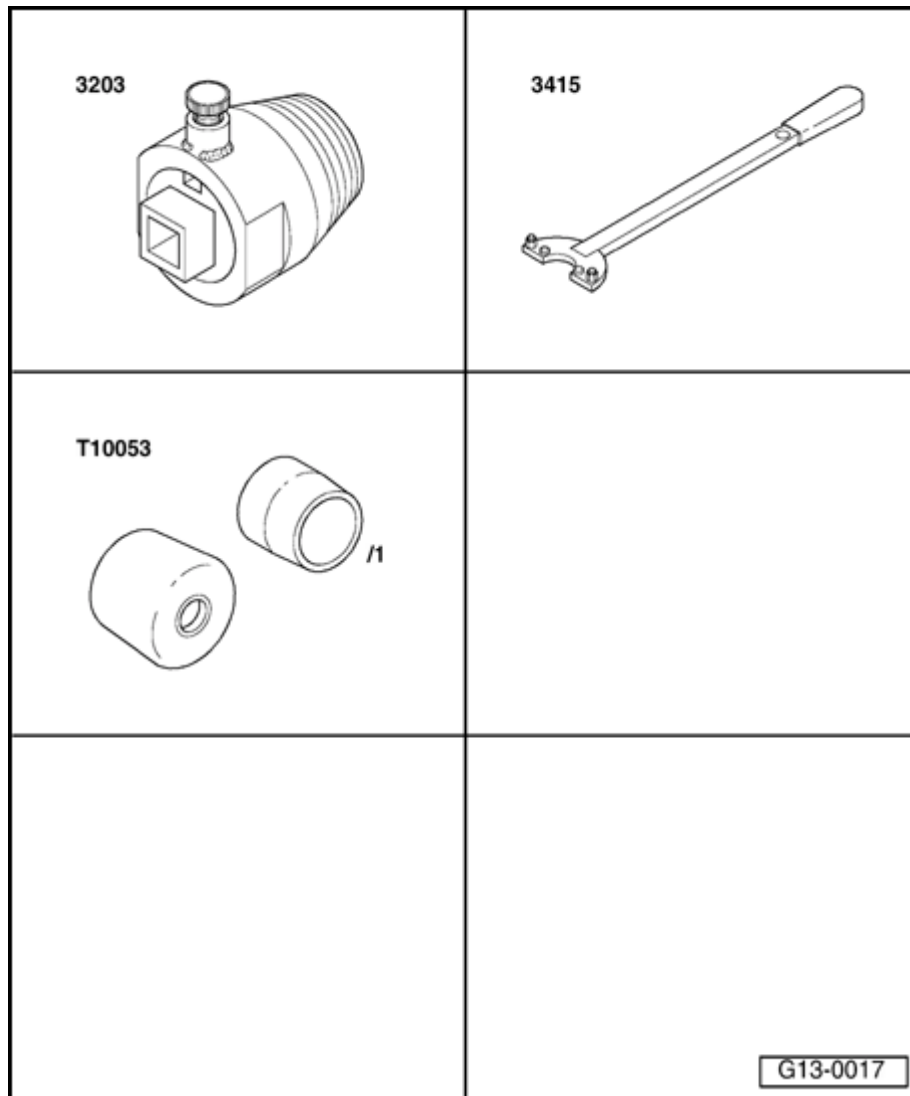
- ◆ Must be located on dowel sleeves
- ◆ Do not damage/bend when assembling



11 - Rear sealing flange with oil seal

- ◆ With gasket for cylinder block
- ◆ Do not oil sealing lip of oil seal
- ◆ Make sure that the sealing lip of the sealing ring is not folded back or damaged when installing
- ◆ Removal and installation, removing sump
⇒ [Page 17-11](#)
- ◆ When installing, push guide sleeve from repair kit onto crankshaft

13-51



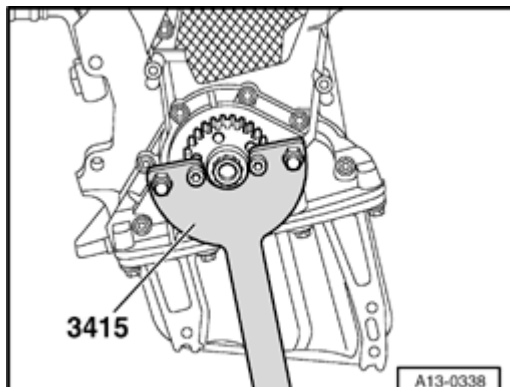
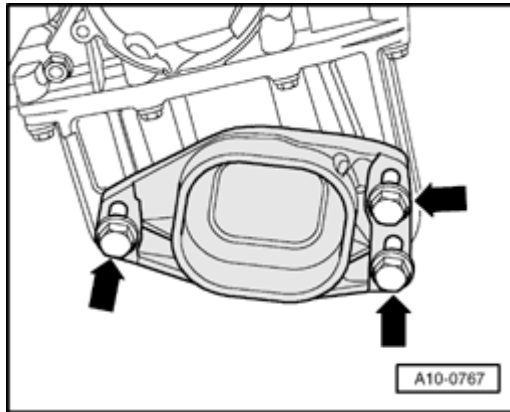
Crankshaft oil seal on pulley end, replacing

Special tools and equipment

- ◆ Oil seal extractor 3203
- ◆ Holding tool 3415
- ◆ Assembly tool T10053

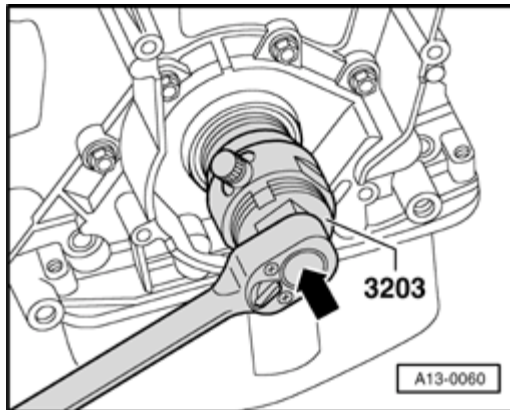
Removing

- Engine in vehicle
- Lock carrier must be in service position ⇒ [Page 13-1](#) .
- Remove toothed belt ⇒ [Page 13-40](#) .
- ✦ - Unbolt stop for torque reaction support -arrows-.



- ✦ - Remove toothed belt sprocket from crankshaft. To do this, counter hold sprocket with 3415.

- Before applying oil seal extractor, thread central bolt for toothed belt sprocket into crankshaft as far as it will go.
- Remove inner section of oil seal extractor 3203 one turn out of outer section and lock with knurled screw.



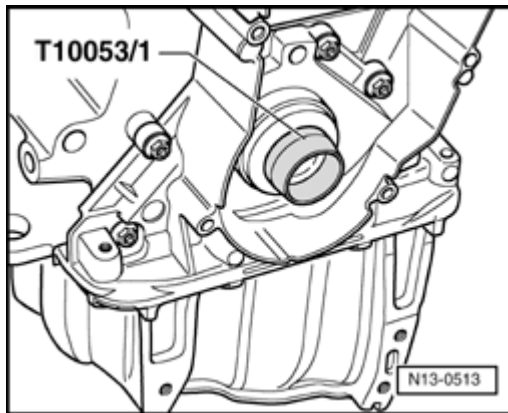
A

- Lubricate threaded head of oil seal extractor, place it in position and exerting firm pressure, screw it into oil seal as far as possible.
- Loosen knurled screw and turn inner part against crankshaft until the oil seal is pulled out.
- Clamp flats of oil seal extractor in vice. Remove oil seal with pliers.
- Clean contact surface and sealing surface.

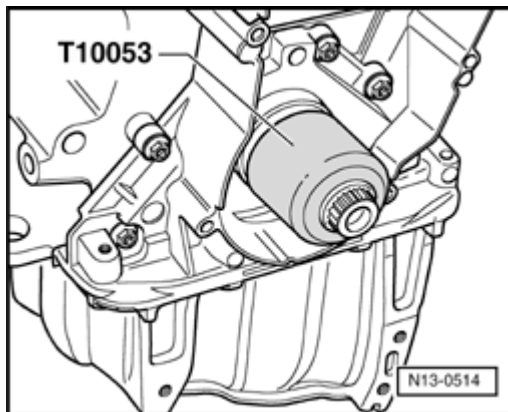
Installing

Note:

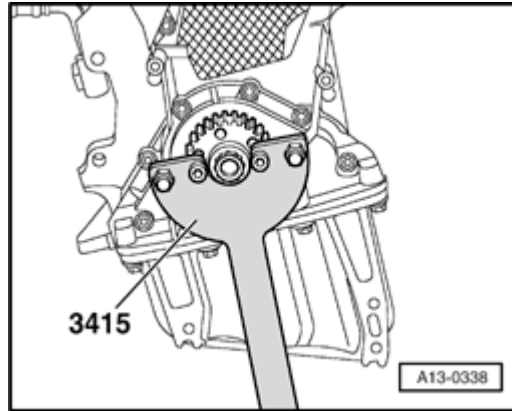
Do not lubricate sealing lip or outer circumference of seal before pressing in.



- Place guide sleeve T10053/1 onto crankshaft journal.
- Slide oil seal over guide sleeve.



- Press sealing ring flush with central bolt of toothed belt sprocket and pressure sleeve from T10053.



- Replace central bolt for toothed belt sprocket.



- Remove crankshaft toothed belt sprocket. To do this, counter-hold toothed belt sprocket with 3415.

Note:

- ◆ *Contact surface between sprocket and crankshaft must be free of oil.*
- ◆ *Do not oil bolt for crankshaft sprocket.*
- Install toothed belt (adjust valve timing) ⇒ [Page 13-44](#) .
- Install ribbed belt and tensioner for ribbed belt ⇒ [Page 13-20](#) .
- Install lock carrier ⇒ [Page 13-1](#) .

Tightening torque

Component	Nm
Toothed belt sprocket to crankshaft	90 + 90° 1)2)

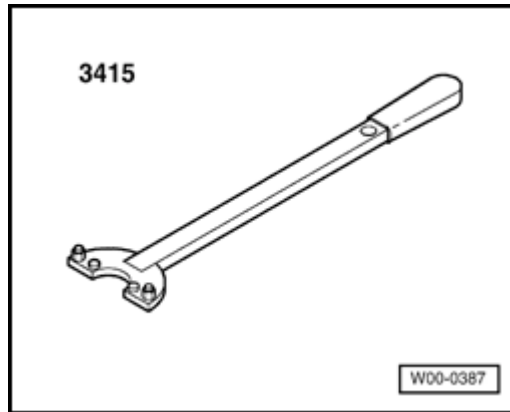
1) Replace bolt

2) 90° corresponds to a quarter turn

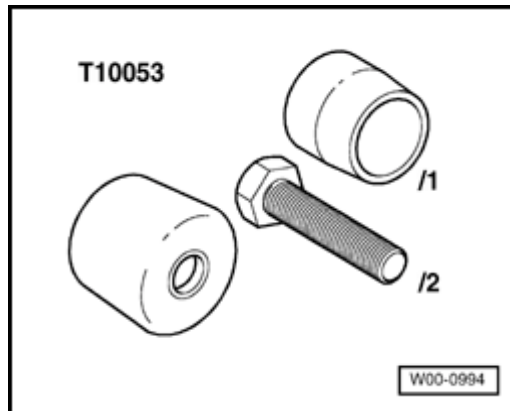
13-56

Front sealing flange, removing and installing

Special tools, material and equipment



- ◆ Holding tool 3415



- ◆ Assembly tool T10053
- ◆ Electric drill with plastic brush attachment
- ◆ Protective goggles
- ◆ Silicone sealant D 176 404 A2

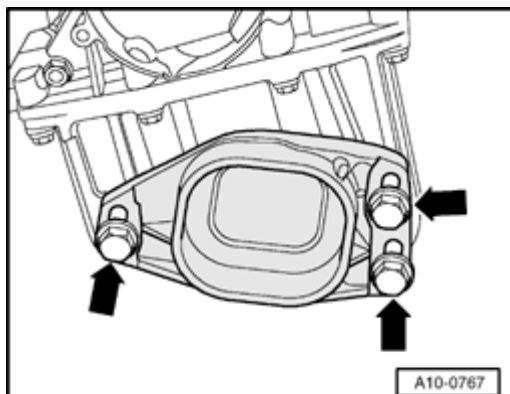
Removing

- Engine in vehicle
- Lock carrier must be in service position ⇒ [Page 13-1](#) .
- Remove toothed belt ⇒ [Page 13-40](#) .

CAUTION!

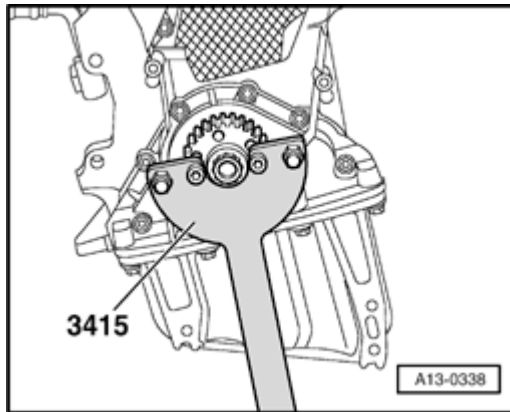
The air conditioner refrigerant circuit must not be opened.

- Disconnect A/C compressor from bracket and secure to body with wire.
- Unbolt bracket for A/C compressor -Item 5 -, ⇒ [Page 13-15](#)
- Unbolt stop for torque reaction support -arrows-.

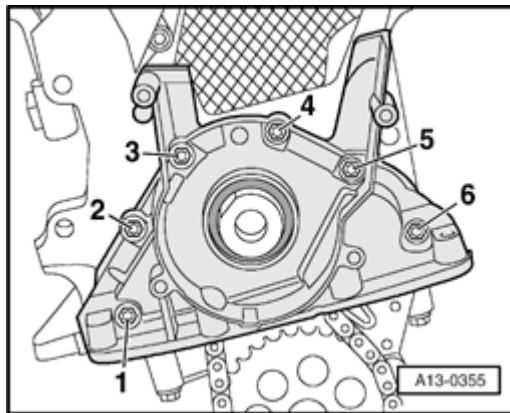


▲

13-58

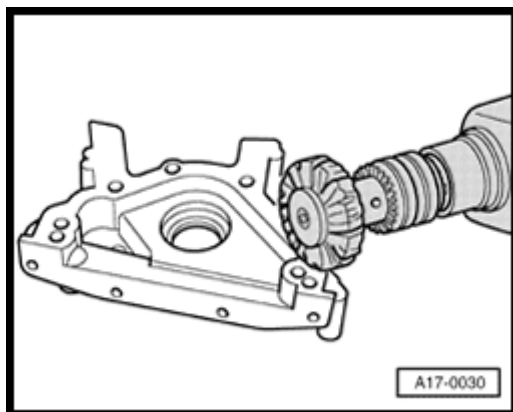


- Remove toothed belt sprocket from crankshaft. To do this, counter hold sprocket with 3415.
- Remove oil pan ⇒ [Page 17-11](#)



- Remove bolts -1 to 6-.
- Pry sealing flange loose and remove.
- Carefully remove any remains of sealant from cylinder block.

13-59



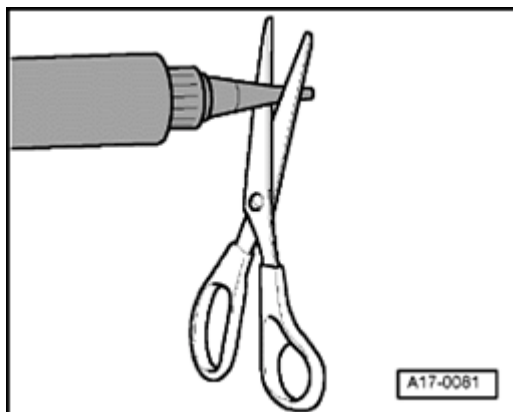
- Remove remaining sealant from sealing flange with rotating plastic brush.

WARNING!***Wear protective glasses.***

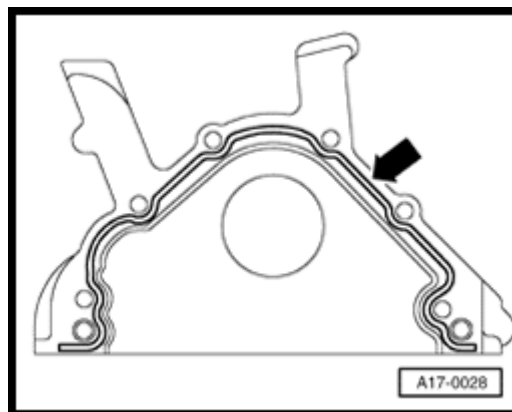
- Clean sealing surfaces: they must be free of oil and grease.

Installing**Note:**

The sealing flange must be installed within 5 minutes after applying silicone sealant.



- Cut off nozzle of silicon sealant tube at front marking (diameter of nozzle = approx. 3 mm).
 - ◆ Silicone sealant D 176 404 A2



- Apply bead of silicone sealant -arrow-onto clean sealing surface of sealing flange, as illustrated (arrow).

- Sealant bead width -arrows-: 2 to 3 mm

Note:

The bead of sealant must not be thicker than 3 mm, otherwise excess sealant will enter the oil pan and obstruct the strainer in the oil intake line.

- Install sealing flange immediately, and tighten all bolts lightly.

Note:

Use guide sleeve T10053/1 to attach the sealing flange with sealing ring installed.

- Tighten sealing flange bolts in diagonal sequence.
- Install oil pan ⇒ [Page 17-23](#) .

Note:

After assembly, the sealant must dry for approx. 30 min. Only then may the engine be filled with oil.

- Install crankshaft oil seal ⇒ [Page 13-54](#) .
- Install toothed belt (adjust valve timing) ⇒ [Page 13-44](#) .
- Install bracket for A/C compressor -Item 5 -, ⇒ [Page 13-15](#) .
- Install lock carrier ⇒ [Page 13-1](#) .

Tightening torques

Component	Nm
Sealing flange to cylinder block	15
Bracket for air conditioner compressor on cylinder block	33
A/C compressor to bracket	25

13-62

Dual mass flywheel/drive plate, removing and installing

Dual-mass flywheel

Special tools and equipment

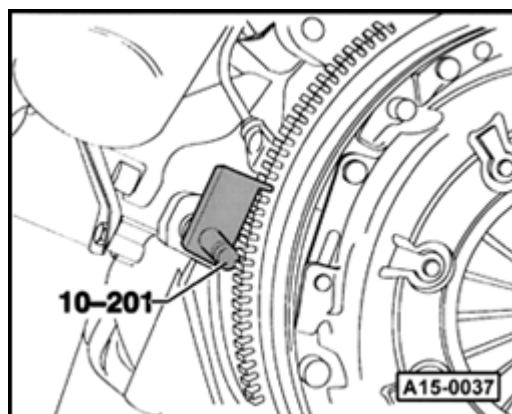
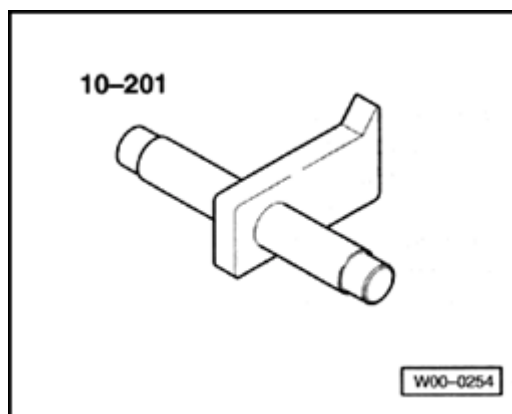
A

- ◆ Counter-hold tool 10-201

Removing

A

- Reverse position of counter-hold tool 10-201 for loosening/tightening bolts.
- Mark position of flywheel relative to engine.
- Unbolt flywheel.



Installing

Installation is carried out in the reverse order or removal; note the following:

- Replace bolts.

Tightening torque

Component		Nm
Dual-mass flywheel	22.5 mm ¹⁾	60 + 90° ²⁾
on crankshaft	43 mm ¹⁾	60 + 180° ³⁾

¹⁾ Bolt length

²⁾ 90° corresponds to a quarter turn

³⁾ 180° = 1/2 turn

Drive plate

Special tools and equipment

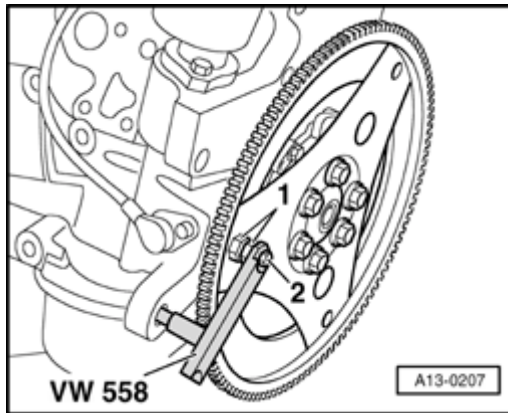
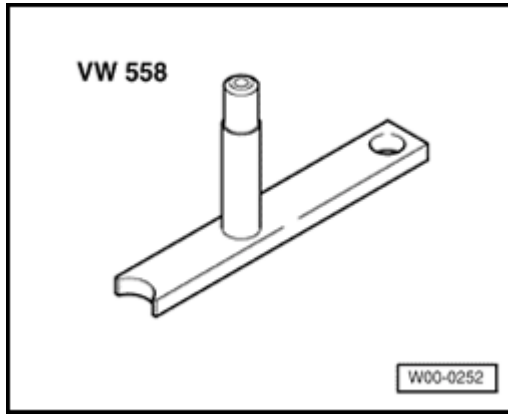


- ◆ Counter hold VW 558
- ◆ Hex bolt M8 x 45 and two M10 hex nuts
- ◆ Caliper gauge or depth measure

Removing

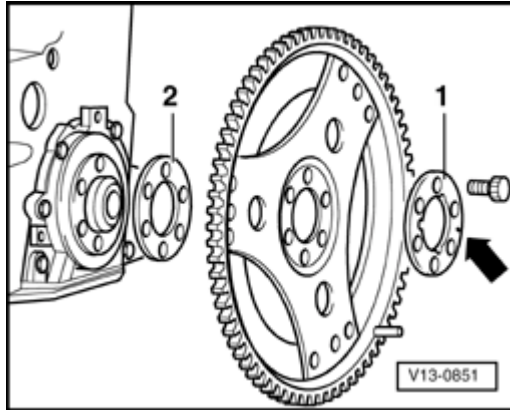


- Secure counter hold tool VW 558 to drive plate with hex bolt M8 x 45 - Item 2-. Place two M10 hex nuts between counter-hold tool and drive plate.
- Mark position of drive plate relative to engine.
- Unbolt drive plate.



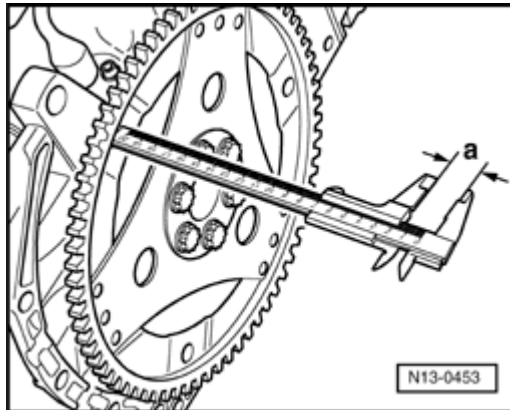
13-65

Installing



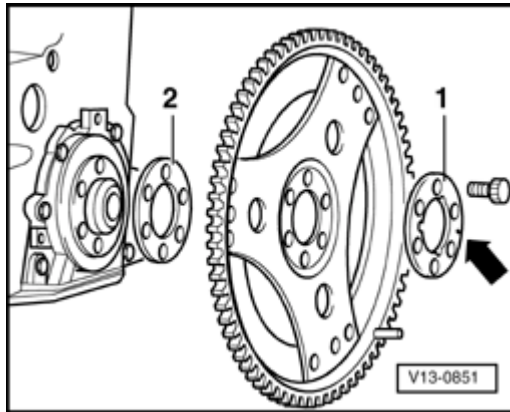
A

- Place drive plate in position with shim -2- and washer -1-. Lug -arrow- must face towards torque converter.
- Insert at least 3 old securing bolts and tighten to 30 Nm.



A

- Measure distance -a- at three points and calculate average value.
 - Specified value: 18.9 to 20.5 mm



If nominal value is exceeded:

A

- Remove drive plate again and fit without shim -2-. Retighten bolts to 30 Nm.
- Measure distance again.

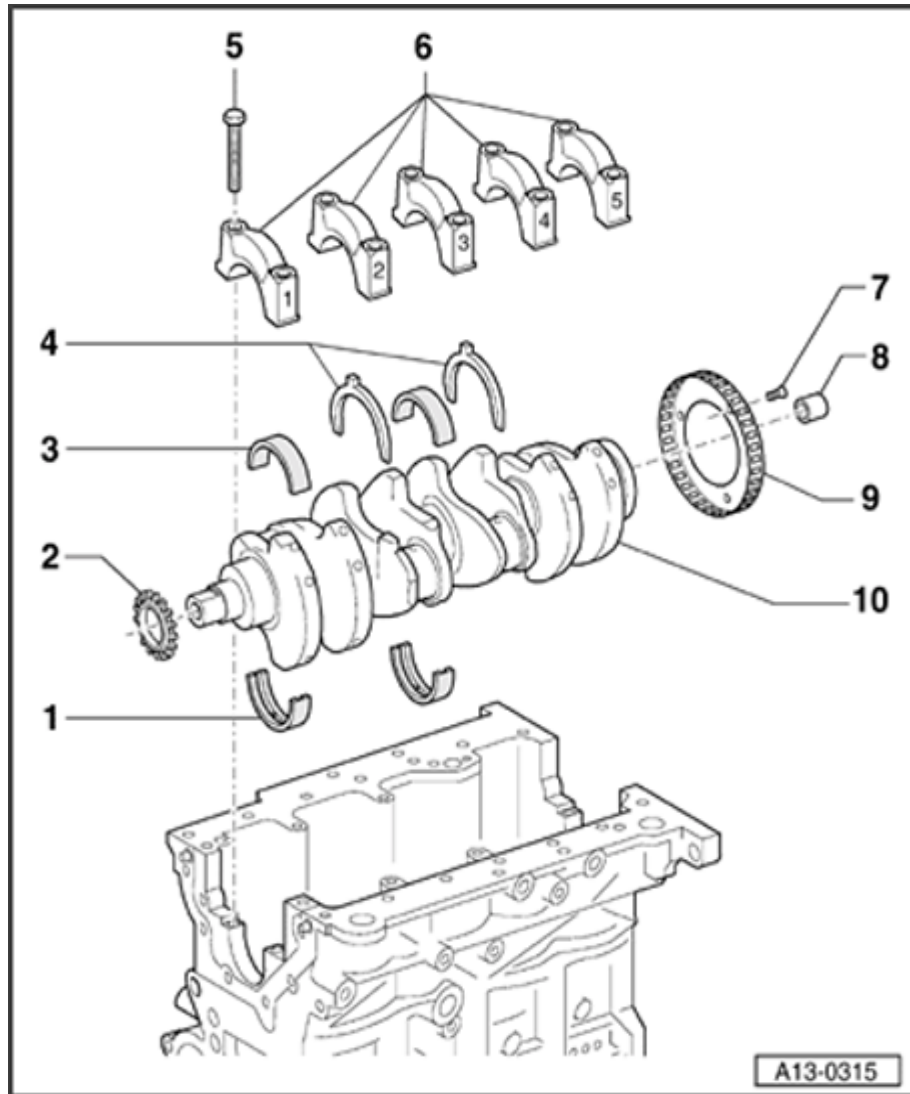
If specified value is attained:

- Install new bolts and tighten.

Tightening torque

Component	Nm
Drive plate to crankshaft	60 + 90° 1)

1) 90° corresponds to a quarter turn



Crankshaft, removing and installing

Note:

When working on the engine, it should be secured to the engine stand using the engine bracket VW 540 ⇒ [Page 10-27](#).

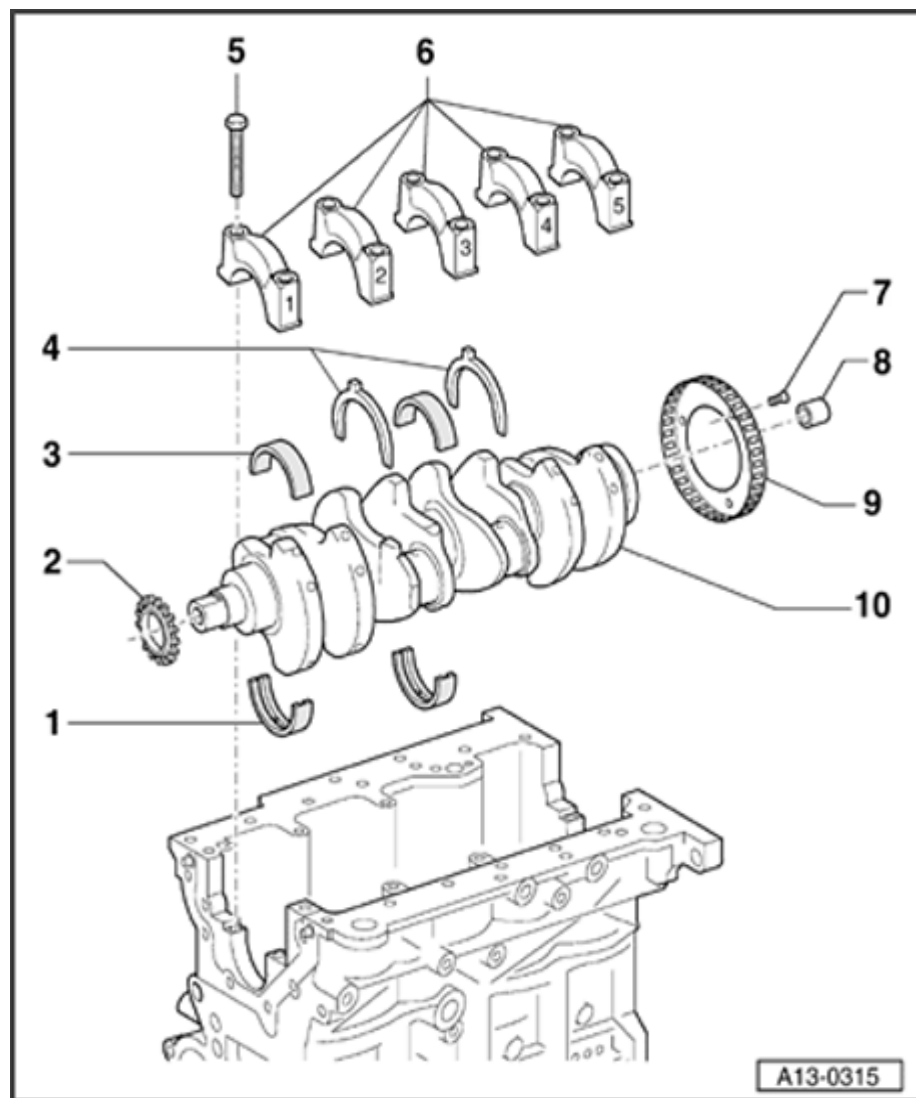
1 - Bearing shell

- ◆ For cylinder block with oil groove
- ◆ Do not interchange used bearing shells (mark).
- ◆ Install new bearing plates for cylinder block with the correct color coding ⇒ Fig. ⇒ [2](#), ⇒ [Page 13-72](#)

2 - Chain sprocket

- ◆ For oil pump drive chain
- ◆ Replacing ⇒ [Page 13-77](#)

13-68



3 - Bearing shell

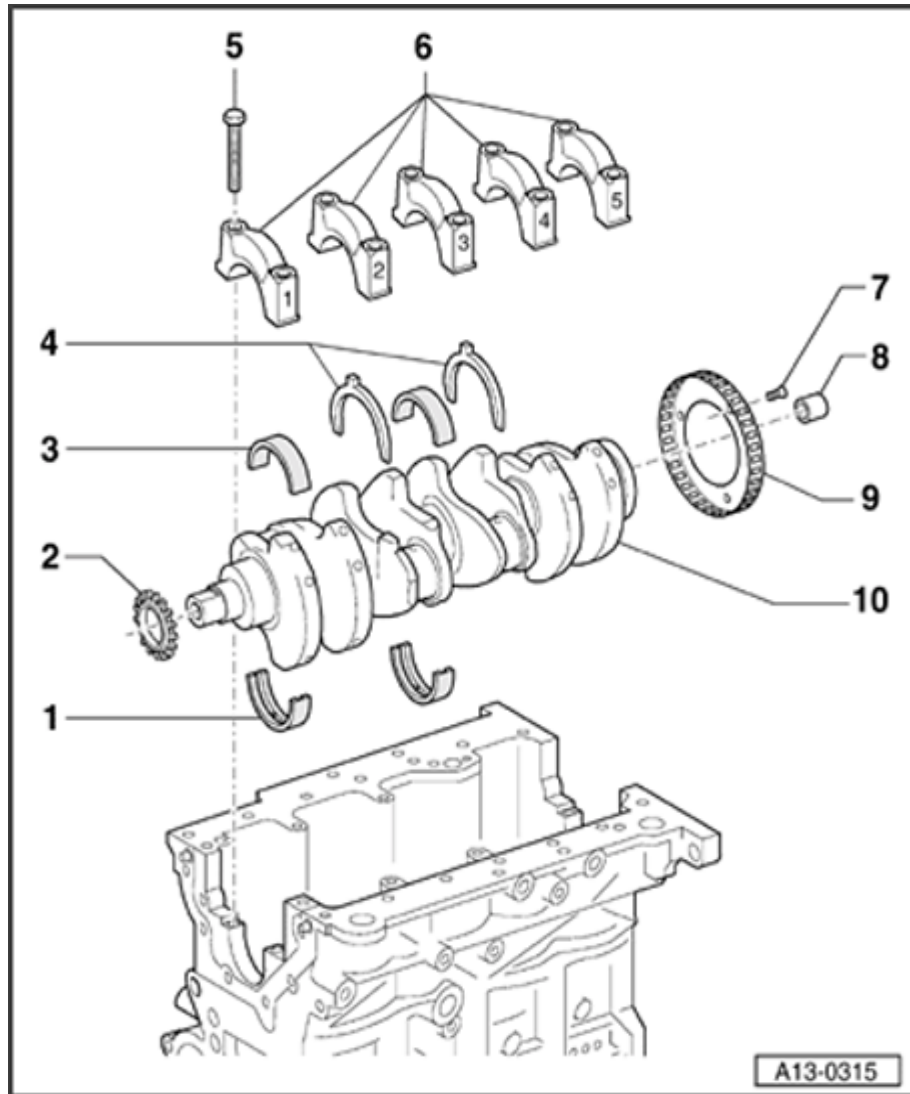
- ◆ For bearing cap without oil groove
- ◆ Do not interchange used bearing shells (mark).
- ◆ The crankshaft bearing plates in the bearing covers are supplied as spare part with the color coding "yellow"

4 - Thrust washers

- ◆ For bearing 3
- ◆ Different types for cylinder block and bearing cap
- ◆ Note locating arrangement

5 - 65 Nm + $\frac{1}{4}$ turn (90 °) further

- ◆ Always replace
- ◆ When measuring radial clearance of crankshaft, tighten to 65 Nm but do not turn further.



6 - Bearing cap

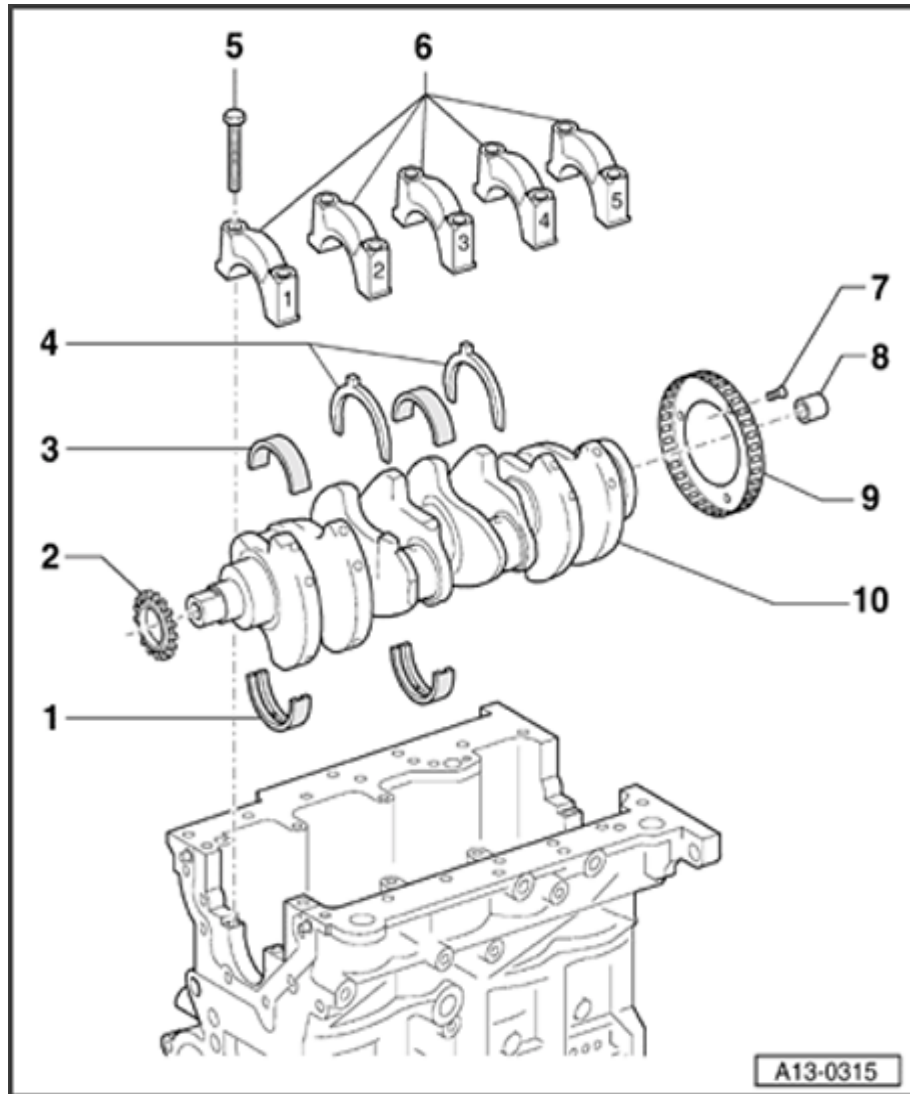
- ◆ Bearing cap 1: Pulley end
- ◆ Bearing cap 3 with recesses for thrust washers
- ◆ Bearing shell retaining lugs (cylinder block/bearing cap) must be on the same side

7 - 10 Nm + $\frac{1}{4}$ turn (90°) further

- ◆ Always replace
- ◆ After each removal of the bolts replace sensor wheel ⇒ Fig. ⇒ [1](#), ⇒ [Page 13-71](#)

8 - Needle bearing

- ◆ For vehicles with manual transmission
- ◆ Pulling out and driving in ⇒ [Page 13-73](#)



9 - Sensor wheel

- ◆ For engine speed sensor -G28-
- ◆ Can only be installed in one position. Holes are offset
- ◆ Always replace sensor wheel if securing bolts have been loosened.
- ◆ Removing and installing ⇒ Fig. ⇒ [1](#) , ⇒ [Page 13-71](#)

10 - Crankshaft

- ◆ Axial clearance new: 0.07 to 0.23 mm, Wear limit: 0.30 mm
- ◆ Check radial clearance with Plastigage[™], New: 0.02 to 0.04 mm, Wear limit: 0.15 mm
- ◆ Do not rotate the crankshaft when checking the radial clearance.
- ◆ Crankshaft dimensions ⇒ [Page 13-76](#)

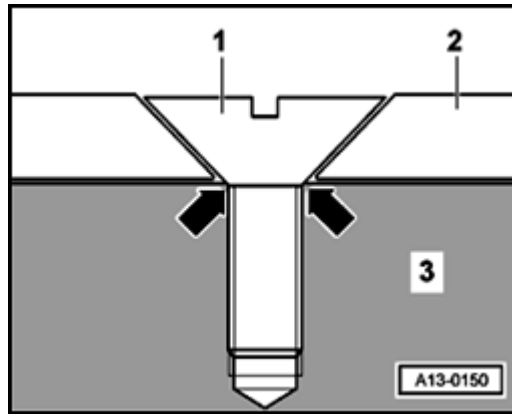


Fig. 1 Removing and installing sensor wheel

Note:

- ◆ Always replace sensor wheel -2- if securing bolts -1- have been loosened..
- ◆ If the securing bolts are tightened a second time, the seats for the countersunk bolt heads in the sensor wheel will be distorted to such an extent that the bolt heads will come into direct contact with the crankshaft -3- (-arrows-) and the sensor wheel will only fit loosely under the bolts.
- ◆ The mounting holes are asymmetrically spaced, so it is only possible to install the sensor wheel in one position.

Tightening torque

Component	Nm
Sensor wheel to crankshaft	10 + 90 ° 1)2)

1) Replace bolts

2) 90 ° corresponds to a quarter turn

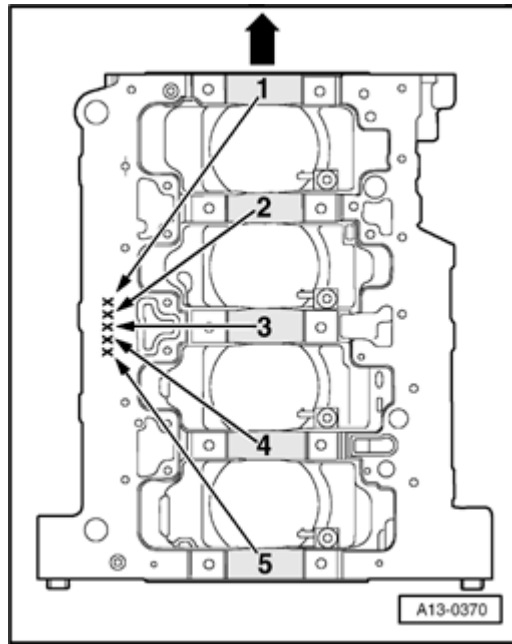


Fig. 2 Allocation of crankshaft bearing plates for cylinder block

The bearing plates with the correct thickness are allocated to the cylinder block at the factory. Colored dots are used to mark the thickness of the bearing plates.

Note:

Arrow points in direction of travel.

The position of each bearing thickness is marked with letters on the lower sealing area of the cylinder block.

Letter on cylinder block		Color of bearing
S	=	Black
R	=	Red
G	=	Yellow

Note:

The crankshaft bearing cups in the bearing covers are supplied as spare part with the color coding "yellow".

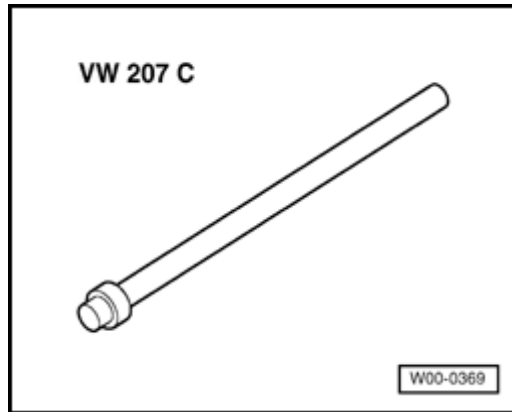
13-73

Crankshaft needle bearing, removing and installing

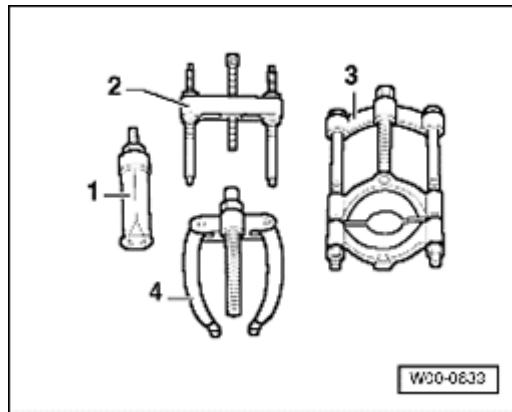
Special tools and equipment



- ◆ Special tool VW 207 C



- ◆ Special tool Kukko 21/1 (Item 1) and Kukko 22/1 (Item 4)
- ◆ Depth gauge



13-74

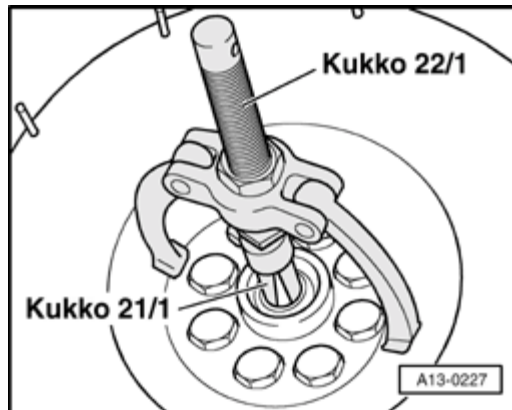
Note:

- ◆ *A needle bearing must be installed in the crankshaft on vehicles with a manual transmission. Install needle bearing if necessary.*
- ◆ *The needle bearing must not be installed in the crankshaft on vehicles with an automatic transmission. Remove needle bearing if necessary.*

Removing

A

- Pull out needle bearing with Kukko 21/1 and Kukko 22/1.

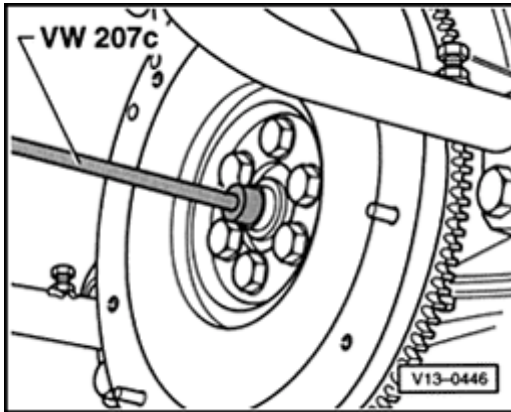


13-75

Installing

A

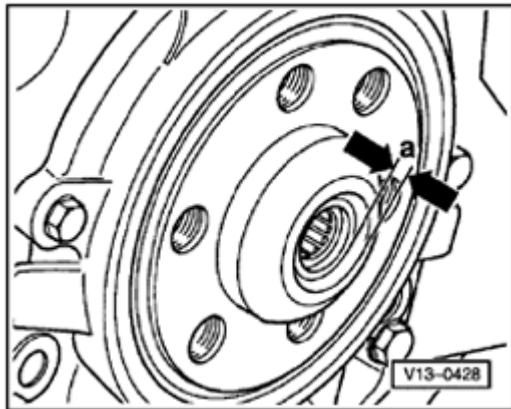
- Drive in using 207c or centralizing pin 3176.
 - ◆ Lettering on needle bearing must be visible when installed



A

- Installation depth of needle bearing

- ◆ Distance a = 1.5 mm



Crankshaft dimensions

(in mm)

Honing dimension	Crankshaft bearing			Conrod journal		
	main journal diameter			main journal diameter		
		-0.017			-0.022	
Basic dimension		54.00			47.80	
		-0.037			-0.042	
		-0.017			-0.022	
1st undersize		53.75			47.55	
		-0.037			-0.042	
		-0.017			-0.022	
2nd undersize		53.50			47.30	
		-0.037			-0.042	
		-0.017			-0.022	
3rd undersize		53.25			47.05	
		-0.037			-0.042	

Chain sprocket, removing and installing

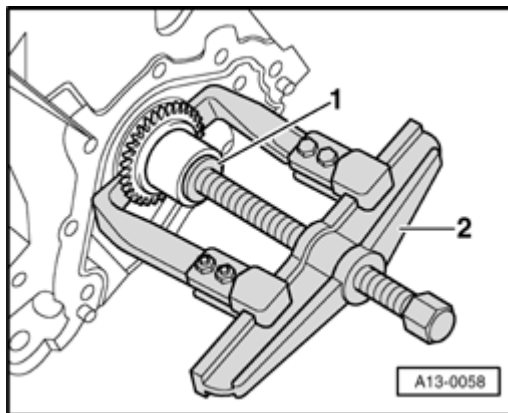
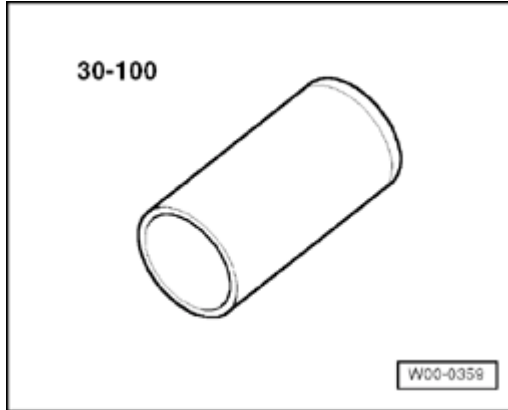
Special tools and equipment



- ◆ Sleeve 30-100
- ◆ Two-arm puller, commercially available.
- ◆ Protective gloves

Removing

- Remove oil pan ⇒ [Page 17-11](#) .
- Removing front sealing flange ⇒ [Page 13-56](#) .
- Disconnect chain wheel of oil pump, remove chain tensioner and chain
⇒ -Item 5 -, ⇒ [Page 17-3](#) .
- Pull chain sprocket off crankshaft with puller -2- (Use a suitable washer
-1- to protect end of crankshaft).



Installing

Installation is carried out in the reverse order of removal; note the following:

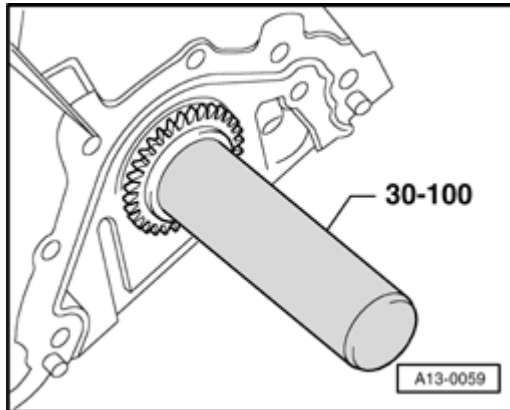
WARNING!

Wear protective gloves!

- Heat chain sprocket in heating appliance for approx. 15 minutes to 220 ° C.

Note:

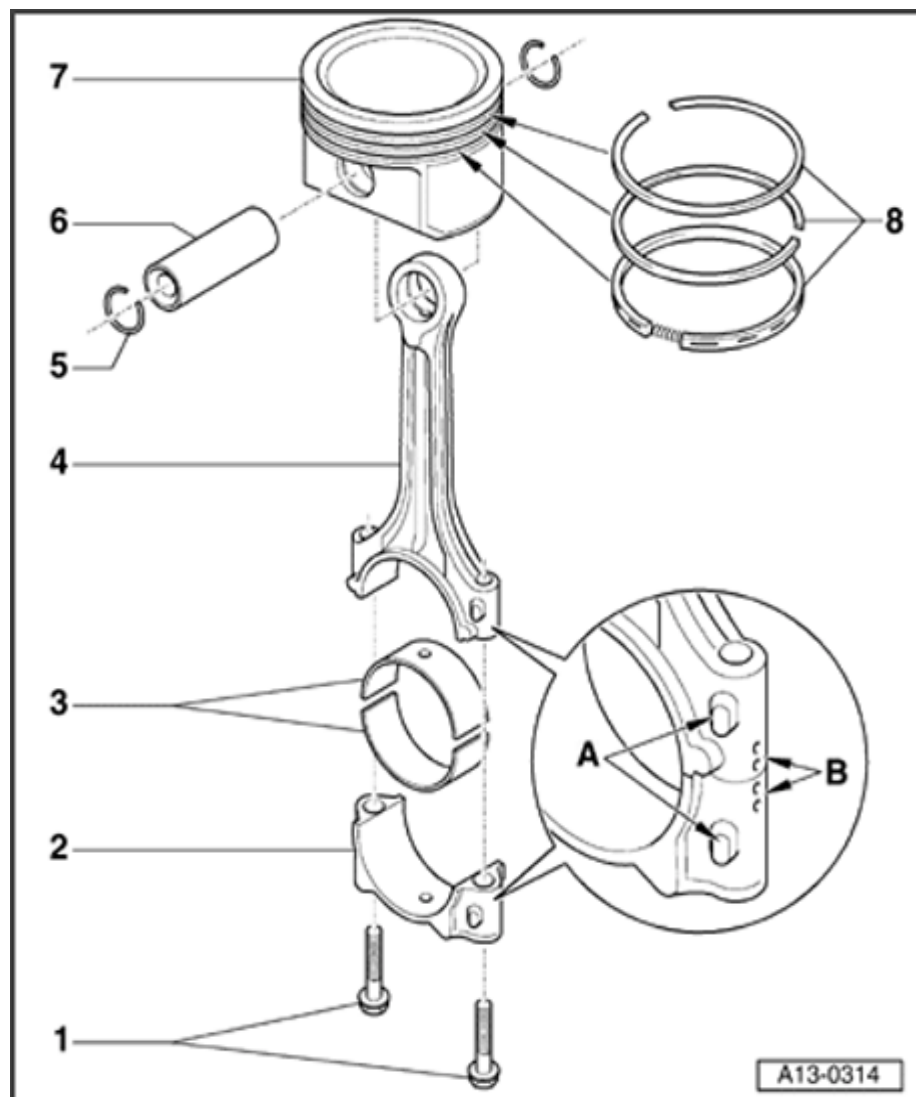
Installation position: wide collar on sprocket facing toward engine



4

- Install chain sprocket on end of crankshaft using pliers and push onto seat on crankshaft with drift sleeve 30-100.

13-79



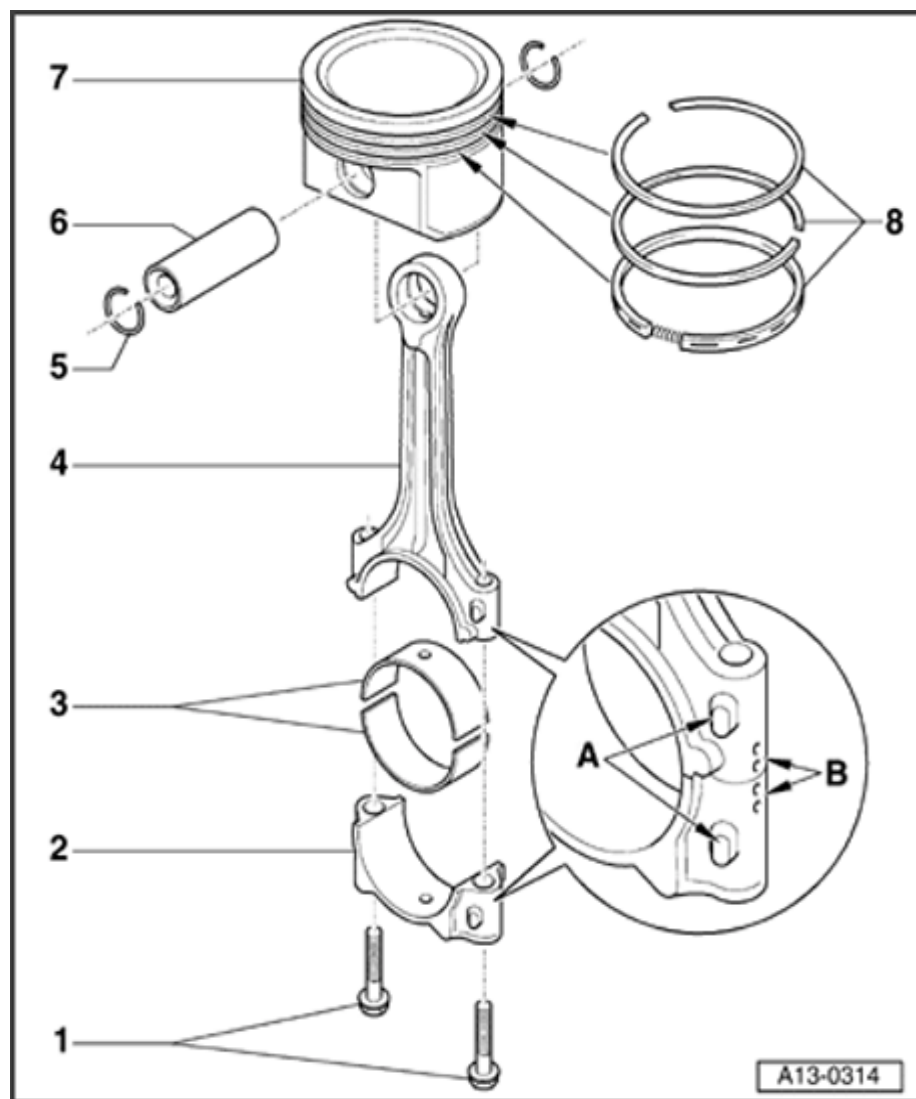
Pistons and connecting rods, disassembling and assembling

Note:

Oil spray jet and pressure relief valve $\Rightarrow$ Fig. $\Rightarrow$ [6](#), $\Rightarrow$ [Page 13-85](#)

1 - Conrod bolt - 30 Nm + $\frac{1}{4}$ turn (90°) further

- ◆ Always replace
- ◆ Oil threads and contact surface
- ◆ To measure radial clearance use old bolt
- ◆ To measure radial clearance tighten to 30 Nm but not further



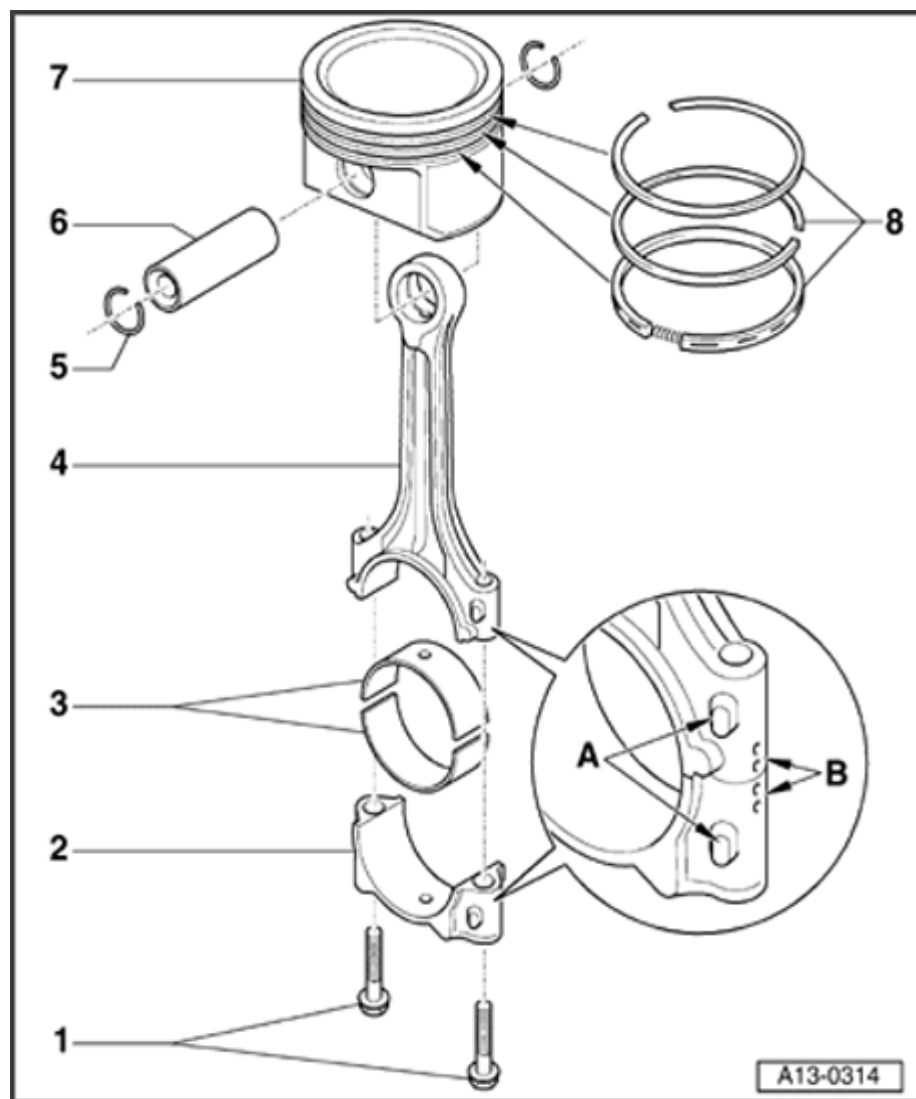
2 - Connecting rod bearing cap

- ◆ Mark cylinder number -B-
- ◆ Installation position: Markings -A- face towards pulley side

3 - Bearing shells

- ◆ Upper bearing shell with oil bore for piston bolt lubrication
- ◆ Installation position ⇒ Fig. ⇒ [5](#) , ⇒ [Page 13-85](#)
- ◆ Do not interchange used bearing shells (mark).
- ◆ Axial clearance New: 0.10 to 0.35 mm, Wear limit: 0.40 mm
- ◆ Check radial clearance with Plastigage[™] : New: 0.01 to 0.05 mm, Wear limit: 0.12 mm. Do not rotate crankshaft when checking radial clearance

13-81



4 - Connecting rod

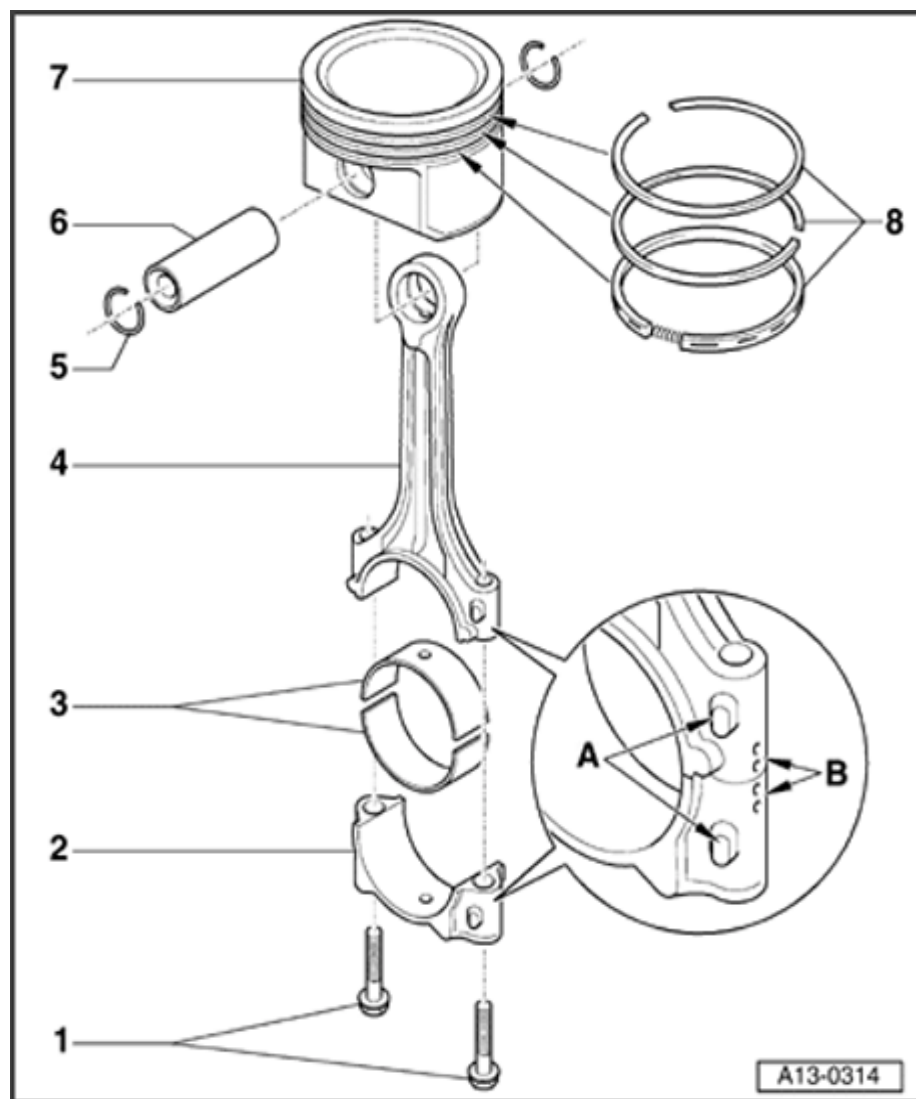
- ◆ Only replace as a set
- ◆ Mark cylinder number -B-
- ◆ Installation position: Markings -A- face toward pulley side
- ◆ With oil bore for piston pin lubrication

5 - Circlip

6 - Piston pin

- ◆ If difficult to remove, heat piston to approx. 60 ° C
- ◆ Remove and install with VW 222a

13-82



7 - Piston

- ◆ Checking ⇒ Fig. ⇒ [3](#) , ⇒ [Page 13-84](#)
- ◆ Mark installation position and cylinder number.
- ◆ Arrow on piston crown points to pulley end
- ◆ Install using piston ring clamp.
- ◆ Piston and cylinder dimensions ⇒ [Page 13-86](#)

8 - Piston rings

- ◆ Offset gaps by 120°
- ◆ Remove and install with piston ring pliers.
- ◆ "TOP" must face piston crown
- ◆ Check ring gap⇒Fig. ⇒ [1](#) , ⇒ [Page 13-83](#)
- ◆ Check ring to groove clearance⇒Fig. ⇒ [2](#) , ⇒ [Page 13-83](#)

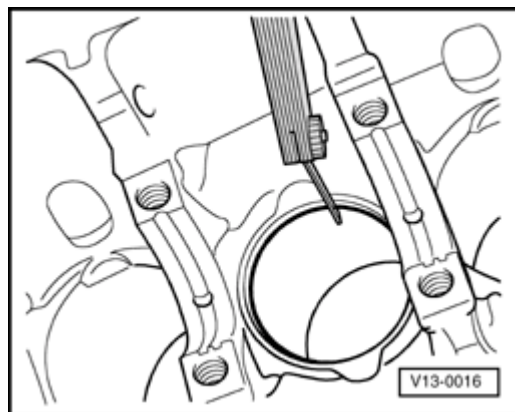


Fig. 1 Checking piston ring gap

- Push ring squarely from above down to approx. 15 mm from bottom end of cylinder. To do this, use a piston without rings.

Piston ring	New	Wear limit
Dimensions in mm		
1. compression ring	0.20 to 0.40	0.8
2. compression ring	0.20 to 0.40	0.8
Oil scraper ring	0.25 to 0.50	0.8

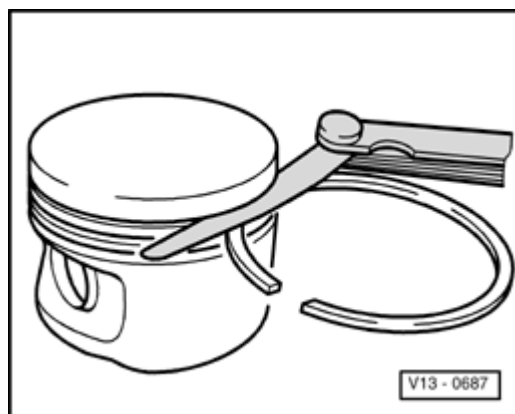
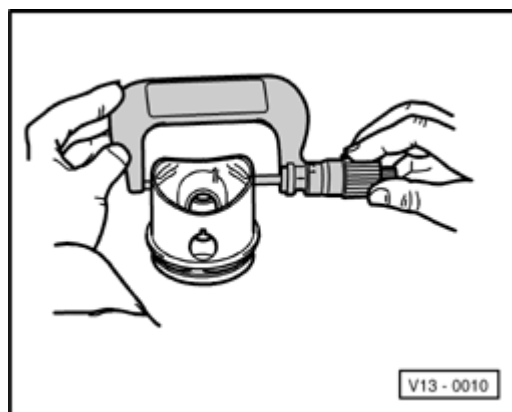


Fig. 2 Checking ring to groove clearance

- Clean groove before checking clearance.

Piston ring	New	Wear limit
Dimensions in mm		
1. compression ring	0.06 to 0.09	0.20
2. compression ring	0.05 to 0.08	0.20
Oil scraper ring	0.03 to 0.06	0.15

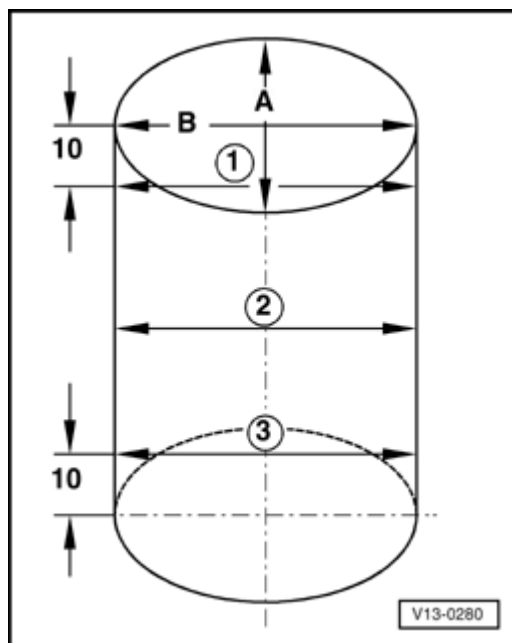
13-84



A

Fig. 3 Checking piston

- Measure pistons approx. 10 mm from lower edge of skirt, at 90° to piston pin axis.
- Permissible deviation from nominal dimension: no more than 0.04 mm

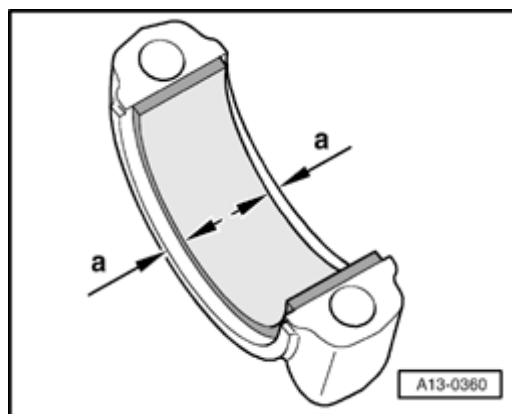


A

Fig. 4 Checking cylinder bores**Special tools and equipment**

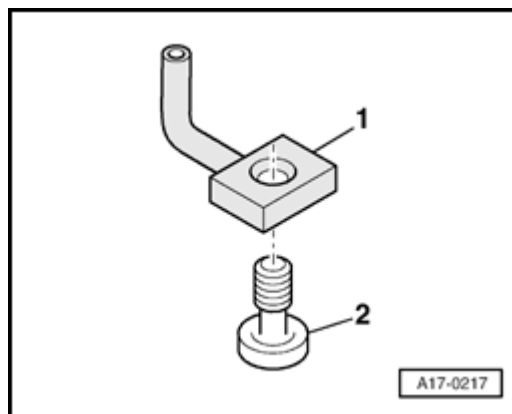
- ◆ Use internal dial gauge 50 to 100 mm
- Take measurements at 3 positions in both lateral direction -A- and longitudinal direction -B-.
- Permissible deviation from nominal dimension: no more than 0.08 mm

13-85

**Fig. 5 Location of bearing shell**

- Install bearing shells centrally into connecting rod or into connecting rod bearing cap.

◆ Distance $a = 3.0 \text{ mm}$

**Fig. 6 Oil spray jet and pressure relief valve**

1 - Oil spray jet (for piston cooling)

2 - Bolt with pressure relief valve - 27 Nm

◆ Opening pressure 1.3 to 1.6 bar

Piston and cylinder dimensions

Honing dimension		Piston diameter	Bore diameter
Basic dimension	mm	80.950 ¹⁾	81.01
Oversize	mm	81.450 ¹⁾	81.51

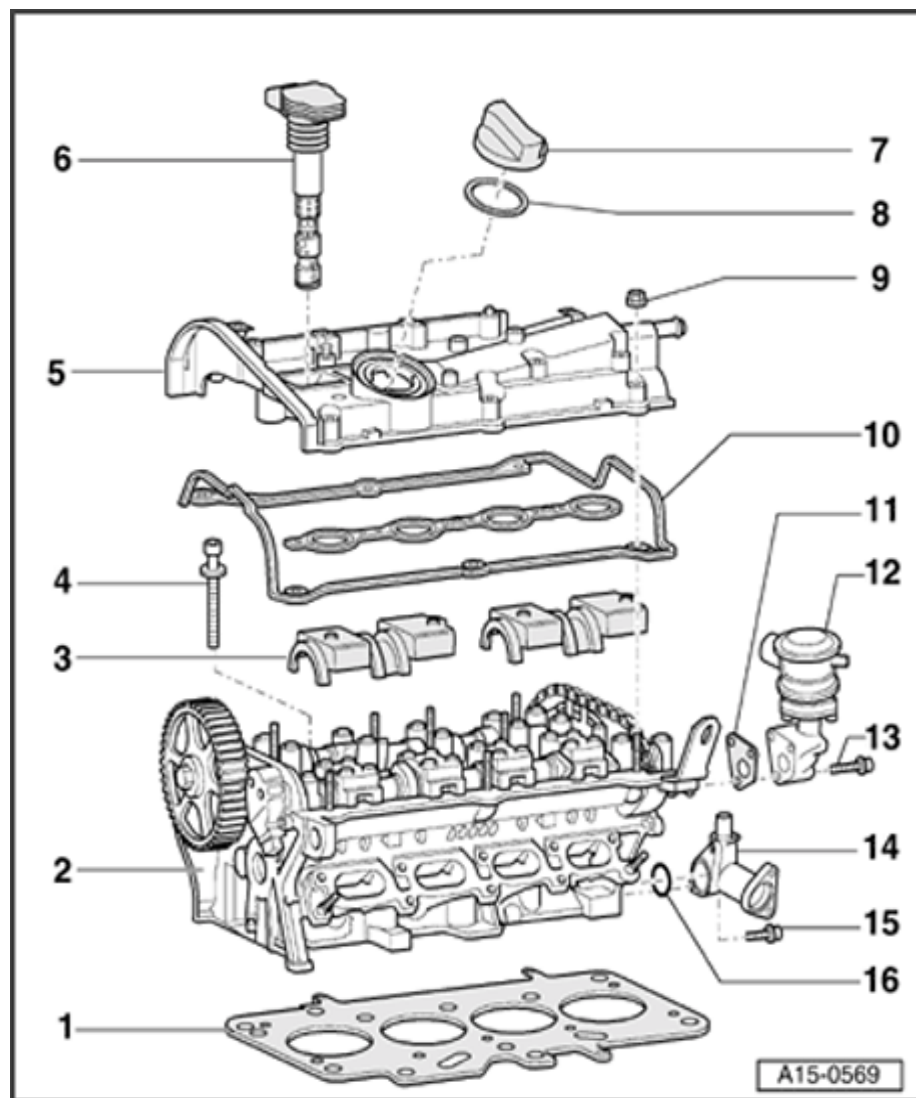
¹⁾ Dimension without graphite coating (thickness 0.02 mm). The graphite coating on the piston skirts wears away.

Cylinder head, removing and installing

Note:

- ◆ *Always replace the cylinder head bolts.*
- ◆ *When performing repairs, replace seals, gaskets, self-locking nuts and bolts which have a specified tightening angle.*
- ◆ *The hose connectors and hoses of charge air system must be free of oil and grease before assembling.*
- ◆ *When installing an exchange cylinder head with the camshafts installed, the contact surfaces between bucket tappet and cam running surface must be oiled after installation of the cylinder head.*
- ◆ *The plastic protectors fitted to protect the open valves must only be removed immediately before installing the cylinder head.*
- ◆ *When installing a new cylinder head or cylinder head gasket, drain off all the old coolant and re-fill with new coolant.*

- ◆ *Cylinder heads which have cracks between the valve seats or between valve seat inserts and the spark plug thread can be used further without reducing service life, provided the cracks do not exceed a maximum of 0.3 mm in width, or when no more than the first 4 turns of the spark plug threads are cracked.*



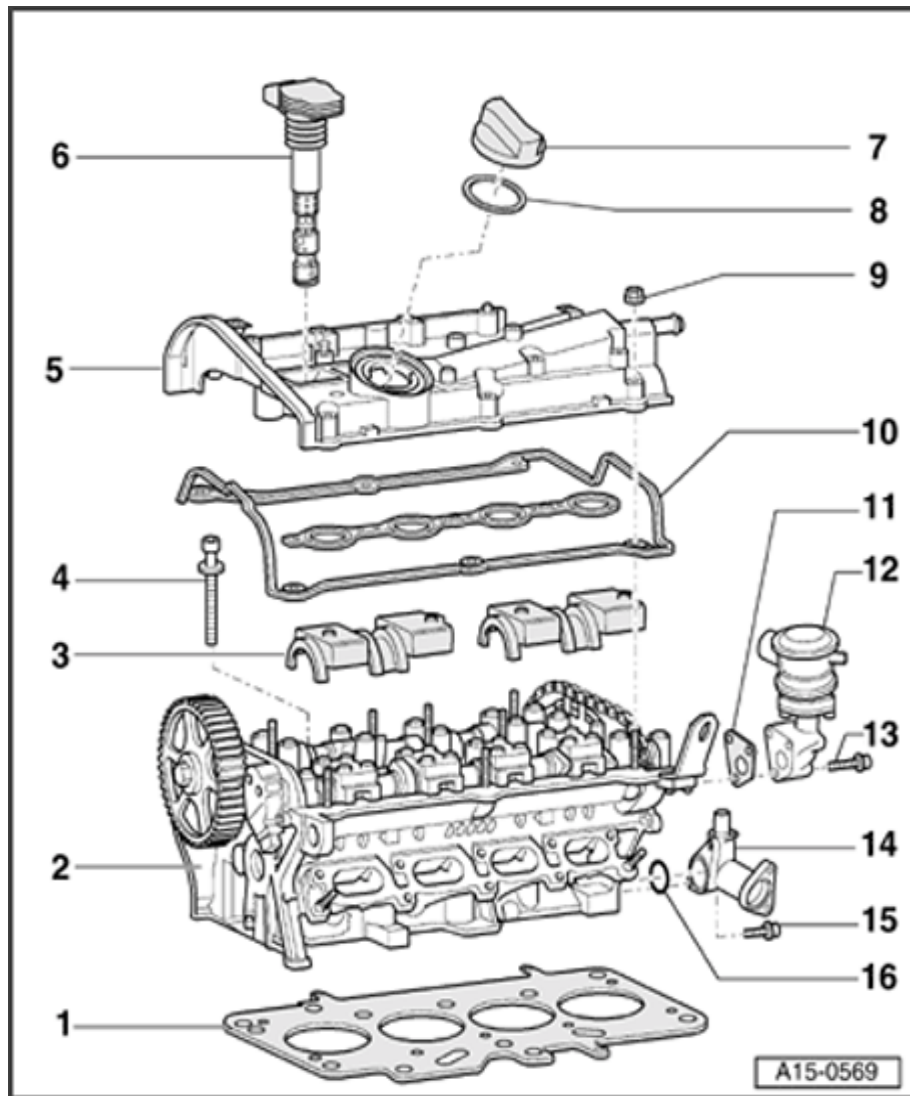
Part I - Cylinder head components

1 - Cylinder head gasket

- ◆ Replacing ⇒ Removing cylinder head, ⇒ [Page 15-20](#)
- ◆ Installation position: Part No. to cylinder head
- ◆ After replacing, fill with fresh coolant

2 - Cylinder head

- ◆ Removing ⇒ [Page 15-20](#)
- ◆ Check for distortion ⇒ Fig. ⇒ [1](#) , ⇒ [Page 15-7](#)
- ◆ Reworking dimension ⇒ Fig. ⇒ [2](#) , ⇒ [Page 15-7](#)
- ◆ Installing ⇒ [Page 15-28](#) .
- ◆ After replacing, fill with fresh coolant

**3 - Oil deflector**

- ◆ Note installation position

4 - Cylinder head bolt

- ◆ Always replace
- ◆ Note sequence when loosening ⇒ [Page 15-27](#)
- ◆ Note sequence when tightening ⇒ [Page 15-30](#)

5 - Cylinder head cover

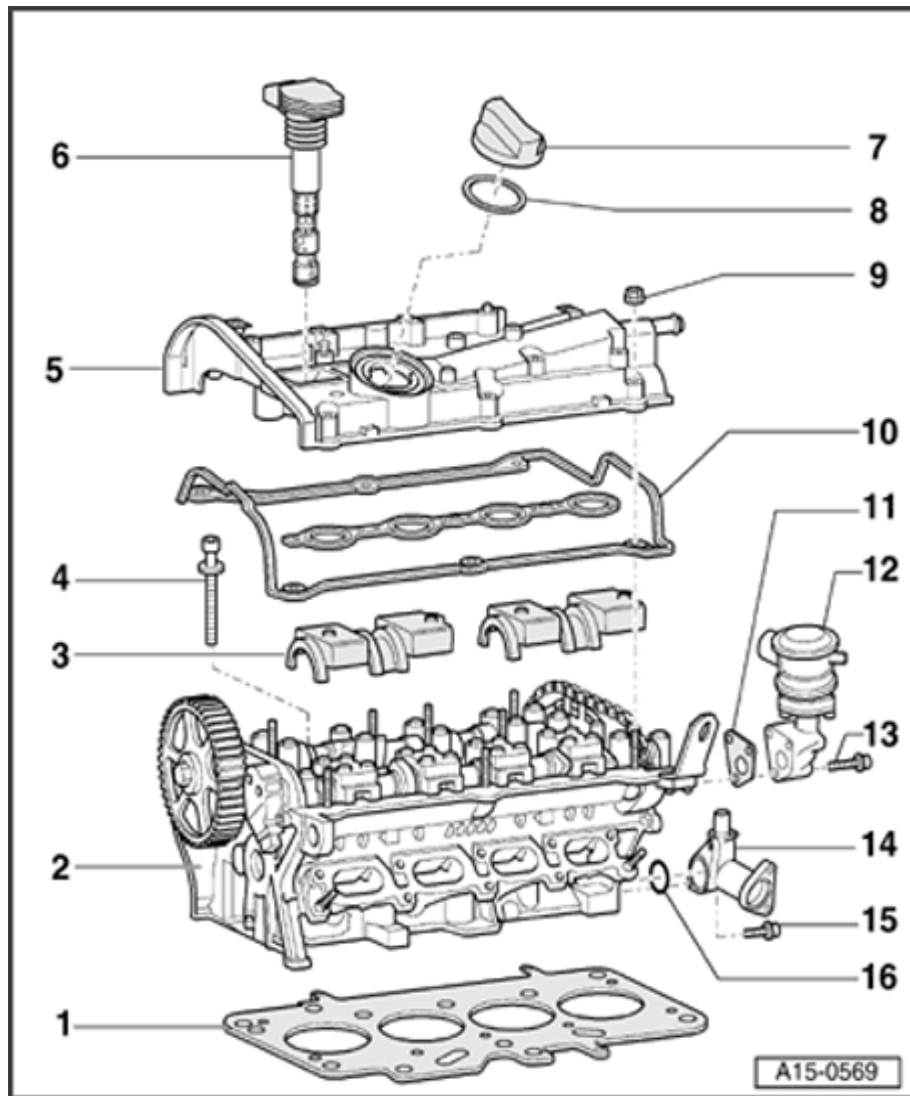
- ◆ Removing and installing ⇒ [Page 15-15](#)

6 - Ignition coil**7 - Cap****8 - Gasket**

- ◆ Replace if damaged or leaking

9 - 10 Nm

- ◆ First tighten inner nuts
- ◆ Tighten outer nuts diagonally

**10 - Cylinder head cover gasket**

- ◆ Replace if damaged or leaking
- ◆ Before installing gasket apply "AMV 174 004 01" to sealing points ⇒ Fig. ⇒ [3](#) and Fig. ⇒ [4](#) , ⇒ [Page 15-8](#)

11 - Gasket

- ◆ Always replace

12 - Combi valve for secondary air inlet

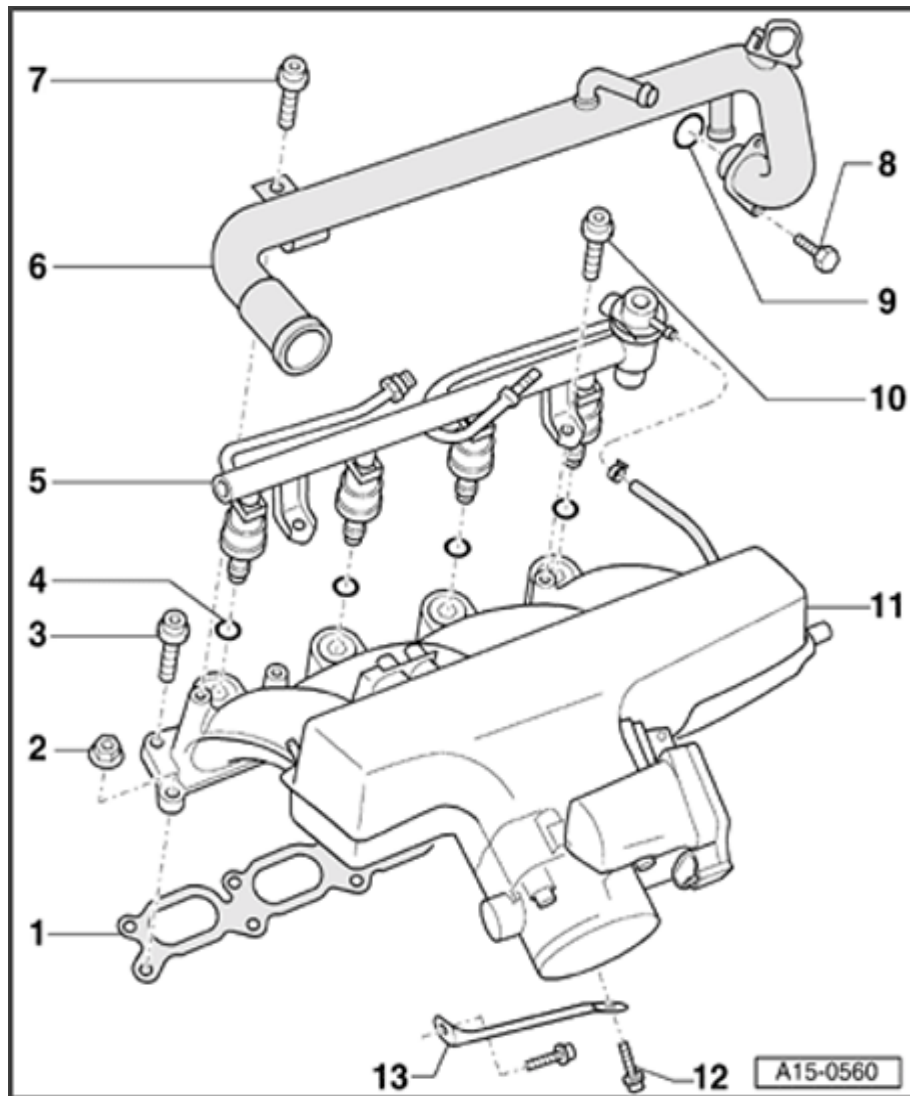
- ◆ With screw connection

13 - 10 Nm**14 - Coolant flange**

- ◆ With coolant temperature sensor

15 - 10 Nm**16 - O-ring**

- ◆ Always replace



Part II - Intake manifold components

1 - Gasket

- ◆ Note installation position
- ◆ Always replace

2 - 10 Nm

3 - 10 Nm

4 - O-ring

- ◆ For injector
- ◆ Always replace

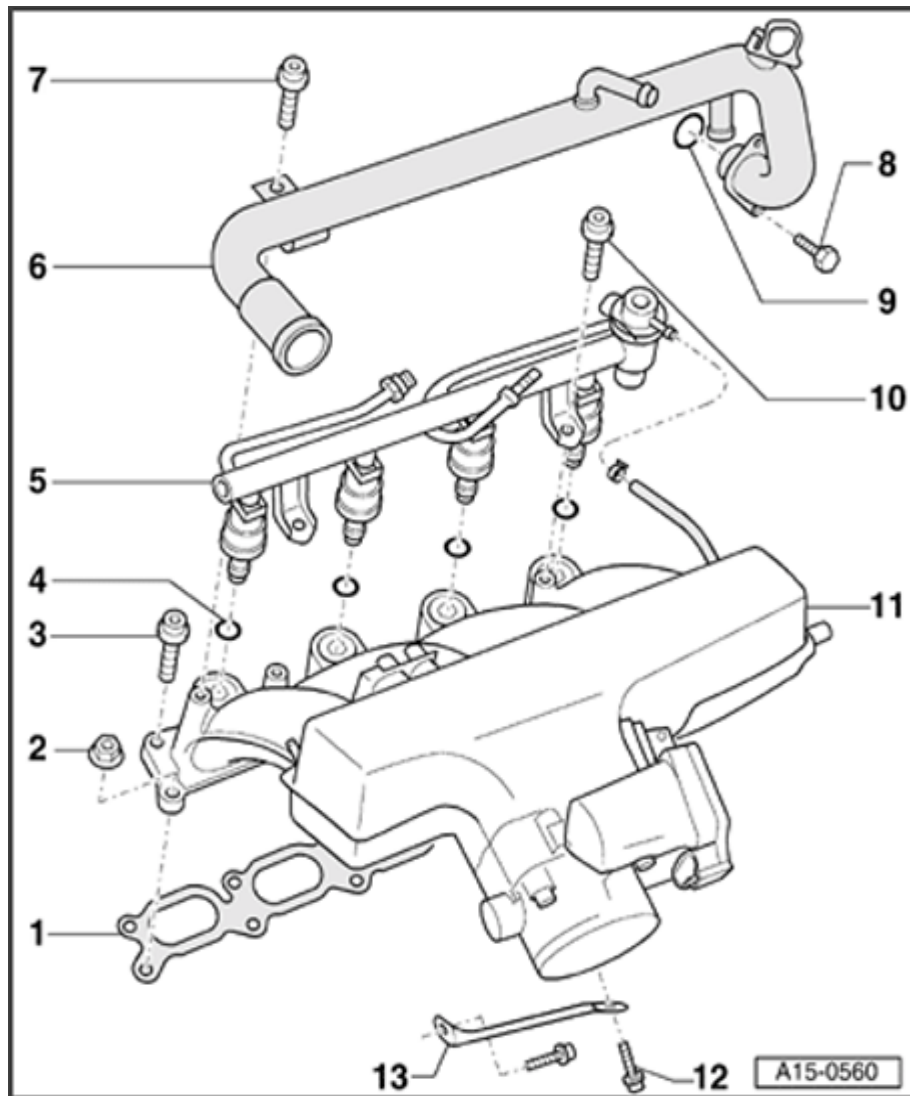
5 - Fuel rail

- ◆ With injectors

6 - Top coolant line

7 - 10 Nm

8 - 10 Nm

**9 - O-ring**

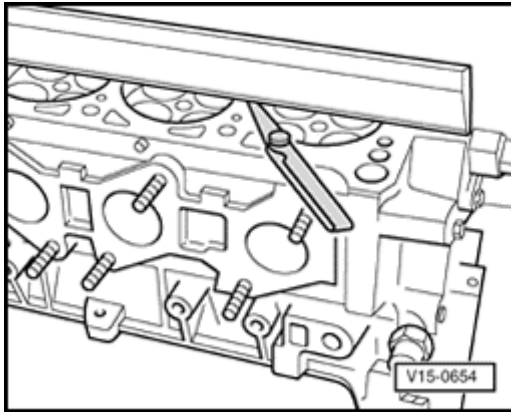
- ◆ For top coolant line
- ◆ Always replace

10 - 10 Nm**11 - Intake manifold**

- ◆ Removing and installing ⇒ [Page 15-9](#)

12 - 20 Nm**13 - Support**

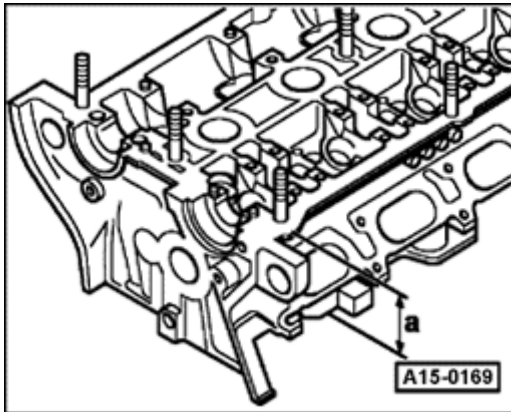
- ◆ For intake manifold



A

Fig. 1 Check cylinder head for distortion.

- Use knife edge, straightedge and feeler gauge to measure at several points.
- Max. permissible distortion: 0.1 mm

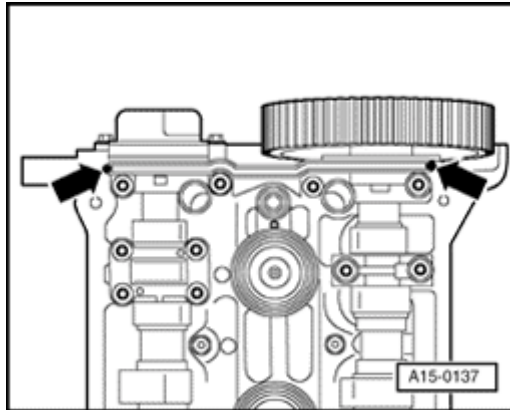


A

Fig. 2 Reworking dimension for cylinder head

Reworking the cylinder head (shaving) is only permitted down to minimum dimension -a-.

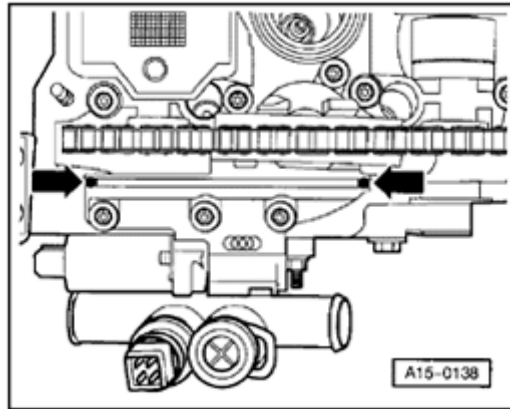
- ♦ Minimum dimension -a- = 139.20 mm



A

Fig. 3 Seal connections between double bearing cap and cylinder head

- Apply a small quantity of sealant AMV 174 004 01 to sides of joints - arrows- on upper sealing surface of cylinder head.



A

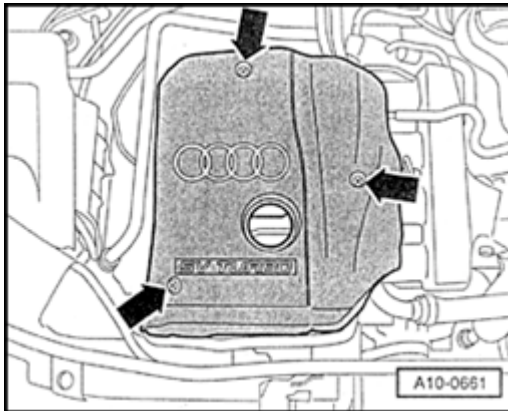
Fig. 4 Seal connections between camshaft adjuster and cylinder head

- Apply a small quantity of sealant AMV 174 004 01 to sides of joints - arrows- on upper sealing surface of cylinder head.

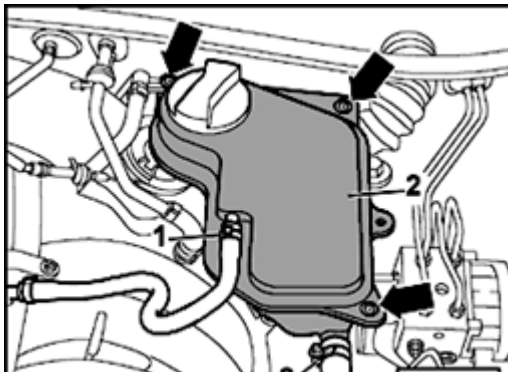
Intake manifold, removing and installing

Removing

- Observe or obtain radio anti-theft code on vehicles with coded radio.
- Disconnect Ground strap at battery with ignition switched off.

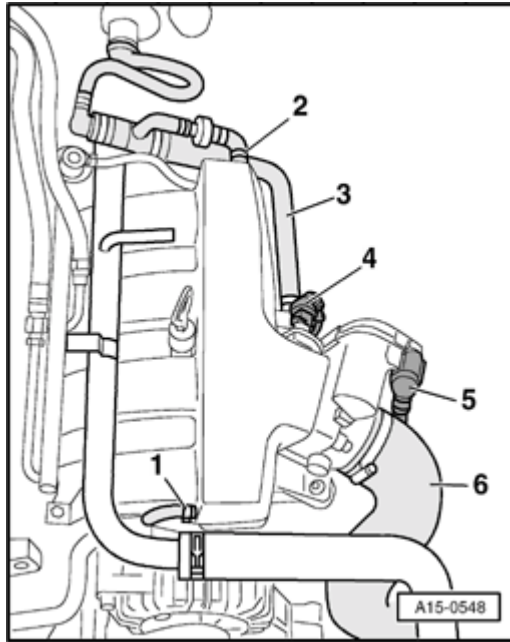
**A**

- Remove engine cover -arrows-.
- Drain coolant ⇒ [Page 19-4](#) .

**A**

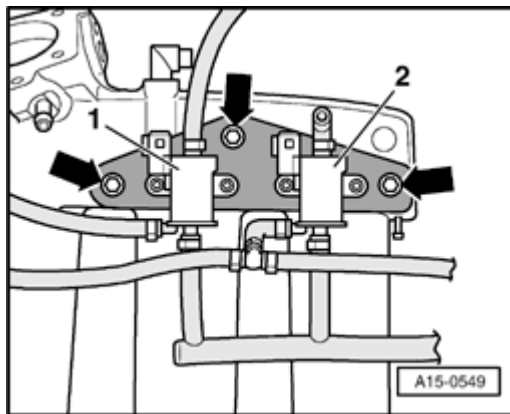
- Disconnect coolant hoses -1- and -3-.
- Unbolt coolant expansion tank -2- (-arrows-).
- Disconnect electrical wiring to coolant level display switch -F66- on bottom of expansion tank.

15-10



A

- Unplug vacuum hoses -1 to 3-.
- Disconnect connectors as follows:
 - 4 - on intake air temperature sensor -G42-
 - 5 - for throttle valve control module -J338-
- Remove the air duct hose -6- from throttle valve control module.



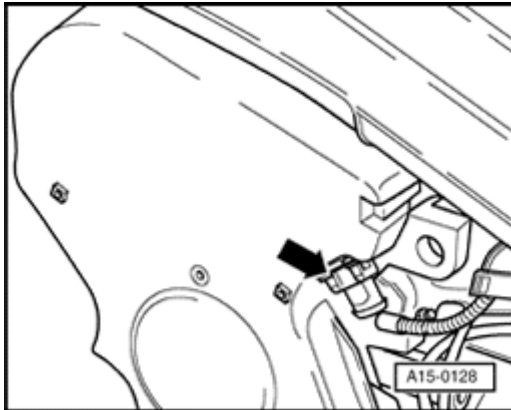
A

- Remove retaining plate for recirculation valve for turbocharger -N249- - 1- from underneath intake line and secondary air inlet valve -N112 -2- - arrows-.

Note:

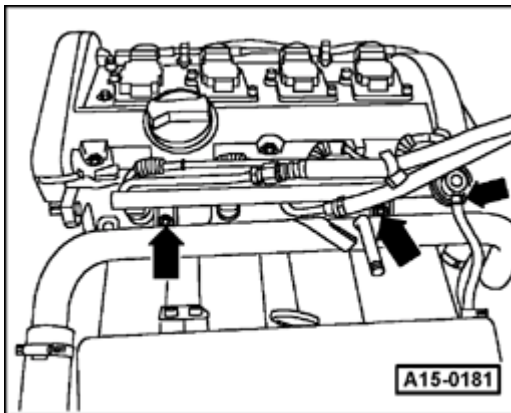
The electrical connectors and vacuum hoses do not have to be disconnected.

15-11



A

- Disconnect connector for Camshaft Position sensor -arrow-.



A

- Remove retaining bolts for fuel manifold and disconnect vacuum line from fuel pressure regulator -arrows-.
- Remove fuel manifold together with injectors from intake manifold and place it on a clean cloth at back of engine compartment.

Note:

Carefully protect the removed injectors from contamination.

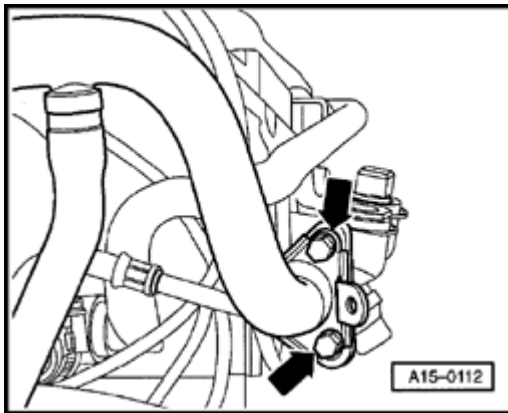
15-12

- Disconnect coolant hoses from upper coolant line.

- Move electrical wiring at top of coolant line aside.

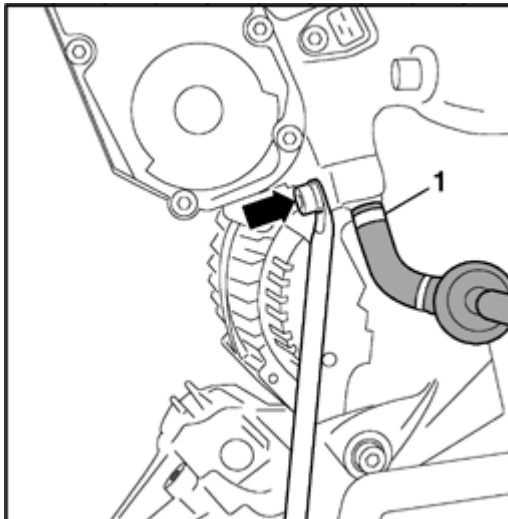
A

- Unbolt upper coolant line from intake manifold and coolant flange - arrows- at back of cylinder head.



A

- Remove intake line support -arrows-.
- Disconnect hose -1- to ACF valve on intake line.
- Pull out oil dipstick.
- Remove bracket of guide line for oil dipstick.



- Remove suction hose from flange and remove.

Note:

Plug intake ports on cylinder head with clean cloths.

Installing

Installation is carried out in the reverse order of removal; note the following:

Note:

- ◆ *All cable ties which are released or cut open when removing must be located in the same position when installing.*
- ◆ *Hose connections and hoses of charge air system must be free of oil and grease before assembling.*
- ◆ *Replace seals and gaskets.*
- Top up coolant ⇒ [Page 19-7](#) .
- After connecting battery, enter anti-theft code for radio.

⇒ *Radio operating instructions*

- Close windows fully using window switches.

15-14

- Actuate all power window switches again for at least one second in the "close" direction to activate automatic open/close function.
- Set clock to correct time.
- Perform throttle-valve control module adaption:

⇒ [Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Engine Code\(s\): AWM, Repair Group 24](#)

Tightening torques

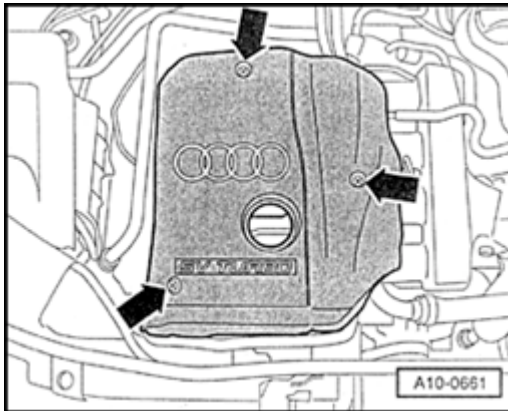
Component	Nm
Intake manifold to cylinder head	10
Support for intake manifold to intake manifold	20
to bracket	20
Fuel manifold to intake manifold	10
Coolant line to coolant flange	10
Coolant line on intake line	10
Hose clamps for coolant hoses	

	2
Hose clamps for air duct hoses	3.5

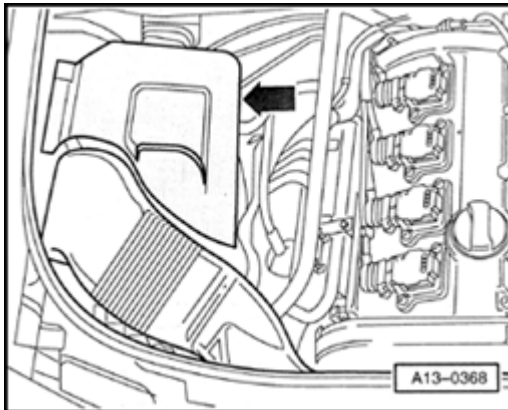
15-15

Cylinder head cover, removing and installing

Removing

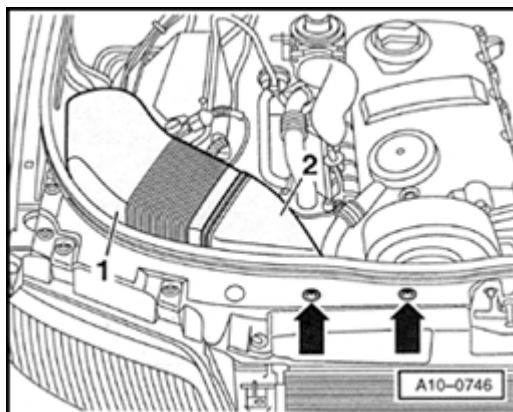


- - Remove engine cover -arrows-.



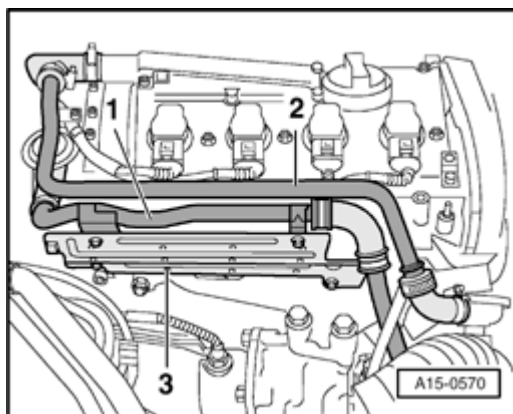
- - Remove air filter cover -arrow-.

15-16



A

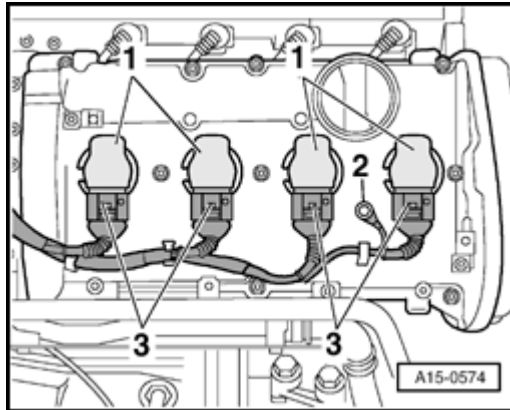
- Remove bolts -arrows-.
- Remove air ducts -1- and -2-.



A

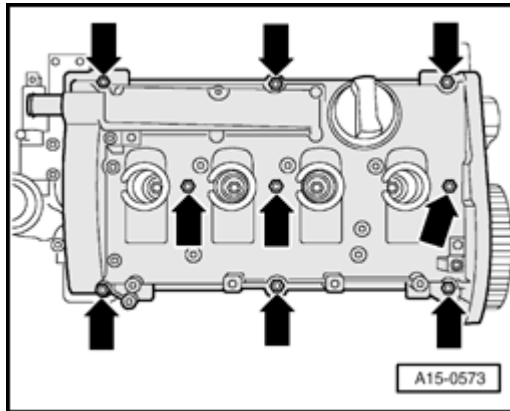
- Remove line of crankcase vent -1-.
- Disconnect hose of crankcase venting from cylinder head cover.
- Remove line -1- from combination valve for secondary air inlet on cylinder head cover and from heat shield -3- (engine code ANB only).
- Slightly swivel secondary air inlet line to side.

15-17



A

- Disconnect Ground wire -2-.
- Disconnect connectors -3-.
- Move lines and hoses aside.
- Remove ignition coils -1-.
- Loosen 2 top retaining clamps for toothed belt guard.



A

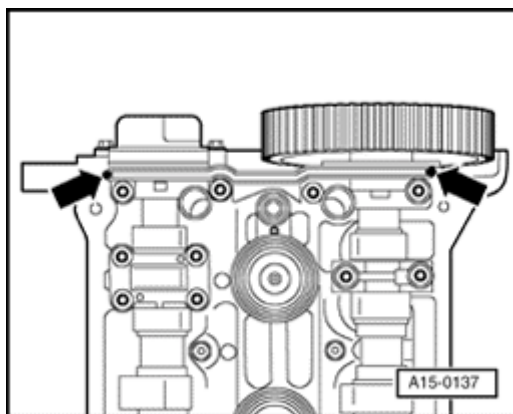
- Loosen nuts -arrows- for cylinder head cover and remove cylinder head cover.

Installing

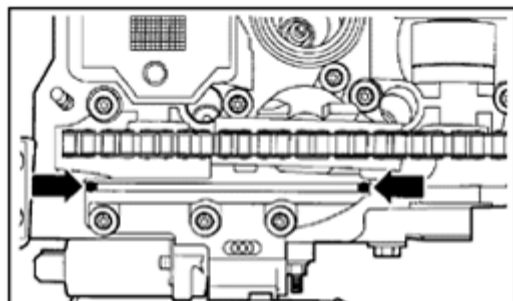
Installation is carried out in the reverse order of removal; note the following:

Note:

- ◆ *Replace seals and gaskets.*
- ◆ *Replace cylinder head cover gaskets if damaged.*



- Apply a small quantity of sealant AMV 174 004 01 to sides of joints - arrows- on upper sealing surface of cylinder head.



- Apply a small quantity of sealant AMV 174 004 01 to sides of joints - arrows- on upper sealing surface of cylinder head.
- First tighten inner nuts for cylinder head cover then tighten outer nuts diagonally.
- Check that upper toothed belt guard is correctly seated.

15-19

Tightening torques

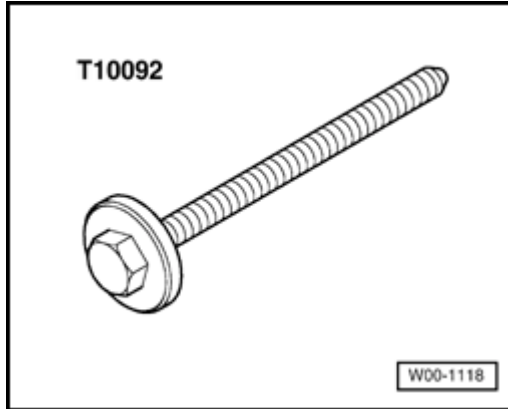
Component	Nm
Cylinder head cover to cylinder head	10
Line of crankcase vent to cylinder headcover	10
Line of secondary air inlet to cylinder head cover	10
Hose clamps	2

Cylinder head, removing

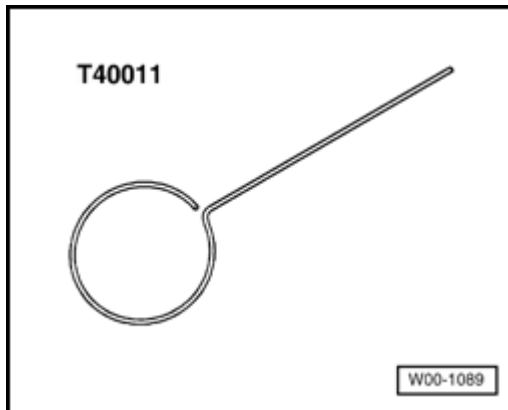
Special tools and equipment



- ◆ Socket head fastener T10092



- ◆ Pin T40011



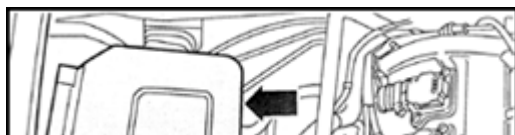
Procedure

- Engine in vehicle
- Lock carrier must be in service position ⇒ [Page 13-1](#) .

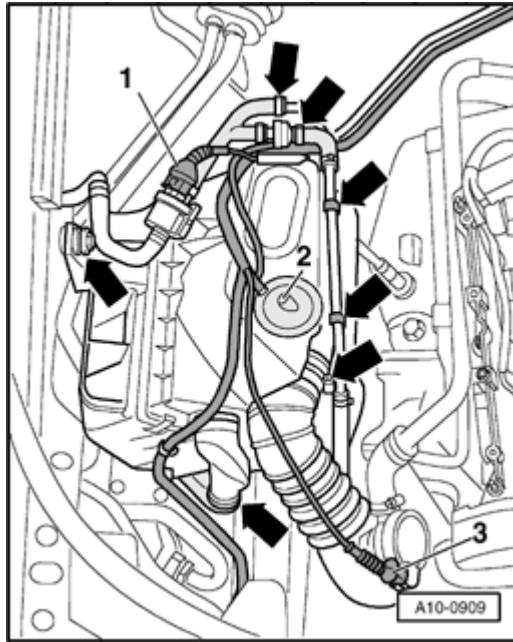
Note:

All cable ties which are released or cut open when removing must be located in the same position when installing.

- Observe or obtain radio anti-theft code on vehicles with coded radio.
- Disconnect Ground strap at battery with ignition switched off.
- Drain coolant ⇒ [Page 19-4](#) .
- Remove intake line ⇒ [Page 15-9](#) .
- Remove ribbed belt and tensioner for ribbed belt ⇒ [Page 13-18](#) .
- Remove air filter cover -arrow-.



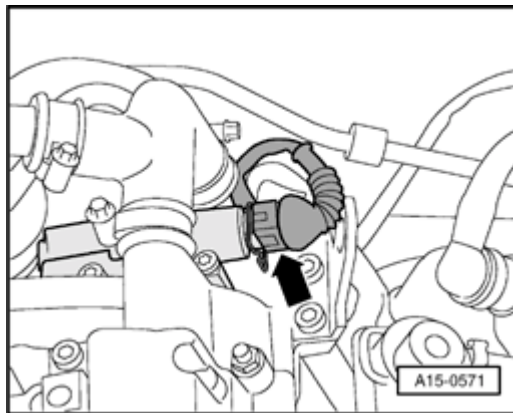
15-22



A

- Disconnect connectors as follows:

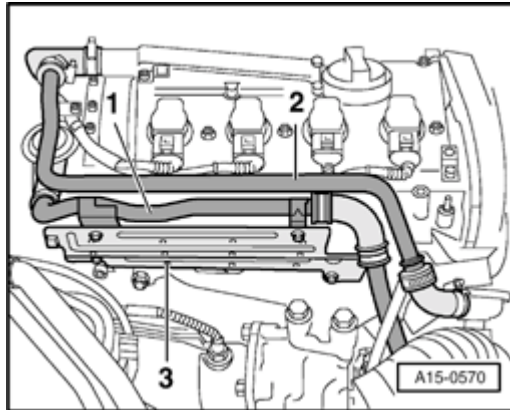
- 1 - on ACF valve (in addition, remove ACF valve from air filter housing)
 - 2 - on air mass meter
 - 3 - on solenoid valve for charge pressure control -N75-
- Disconnect hose connections, move wiring aside and remove air filter housing -arrows-.



A

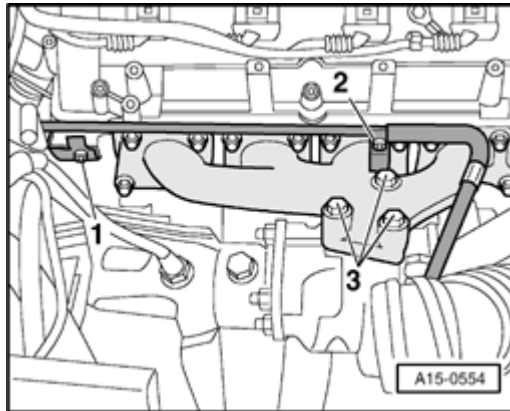
- Disconnect connector -arrow- from camshaft adjuster.

15-23



A

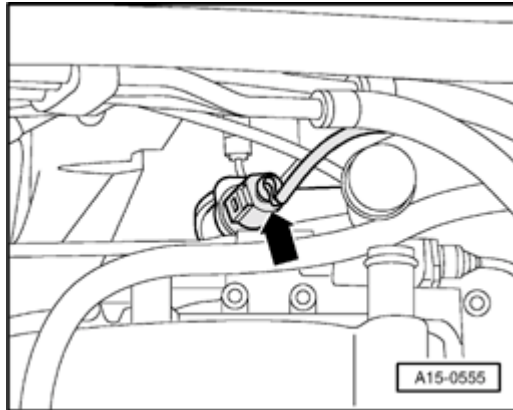
- Remove line of crankcase vent -1-.
- Remove hose of crankcase venting from cylinder head cover.
- Remove line -1- from combination valve for secondary air inlet on cylinder head cover and from heat shield -3- (engine code ANB only).
- Slightly swivel secondary air inlet line to side.
- Remove heat shield.



A

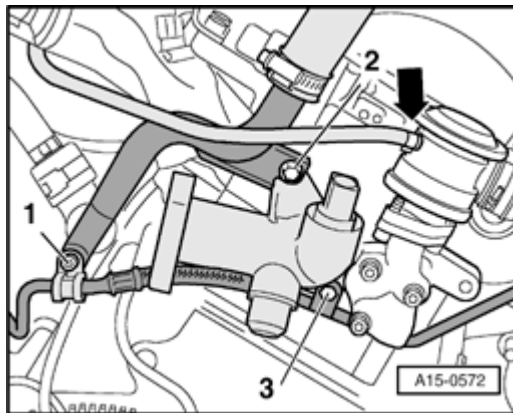
- Remove bolts -1- and -2- of oil feed line.
- Remove bolts -3- for exhaust turbocharger.

15-24



A

- Disconnect connector -arrow- at coolant temperature sensor -G2-/-G62-.



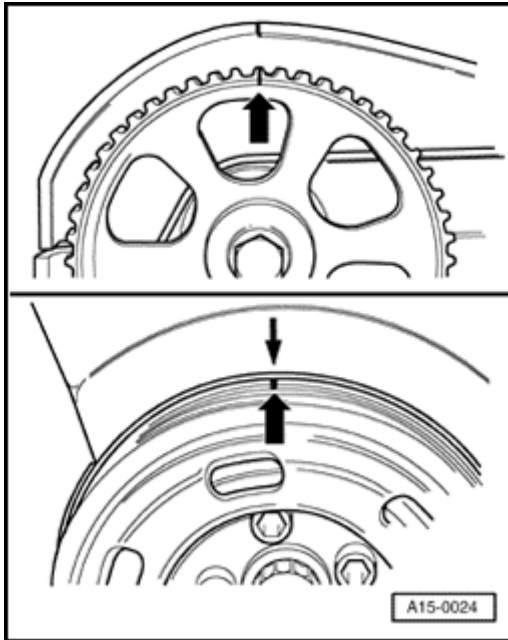
A

- Disconnect vacuum hose -arrow- from combination valve.
- Remove bolts -2- and -3- and remove coolant flange.
- Remove bracket -1- for oil feed line.
- Unclip all wiring from cylinder head and move clear to one side.
- Remove coolant hose going to heat exchanger (heater unit) at back of cylinder head (first release retainers on connecting flange).

- Remove upper toothed belt guard ⇒ [Page 13-35](#).

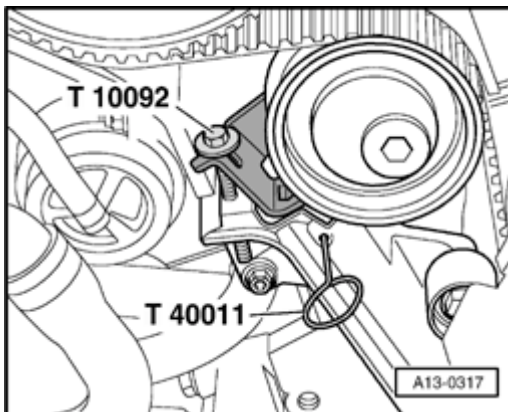
A

- Set crankshaft to markings for TDC of No. 1 cylinder by turning central bolt on crankshaft sprocket in direction of rotation -arrows-.

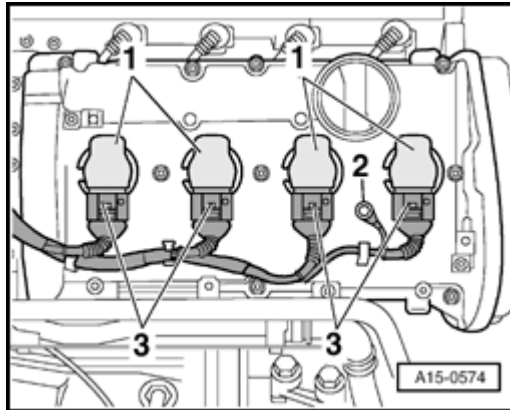


A

- Attach socket head fastener T10092 into tensioner.
- Only tension pressure piston of tensioner until piston is secured with pin T40011.
- Remove toothed belt from camshaft sprocket.

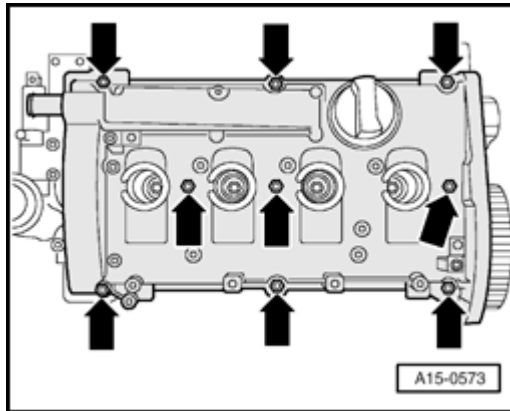


15-26



A

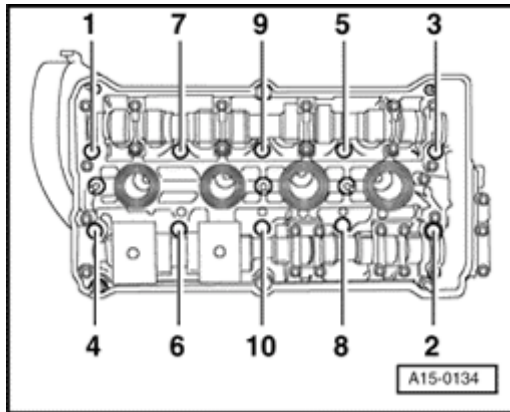
- Disconnect Ground wire -2-.
- Disconnect connectors -3-.
- Move lines and hoses aside.
- Remove ignition coils -1-.



A

- Loosen nuts -arrows- for cylinder head cover and remove cylinder head cover.
- Remove both oil deflectors.

15-27



A

- Loosen cylinder head bolts in correct sequence.
- Remove cylinder head.

Cylinder head, installing

Note:

- ◆ *Always replace the cylinder head bolts.*
- ◆ *When performing repairs, replace seals, gaskets, self-locking nuts and bolts which have a specified tightening angle.*
- ◆ *Secure all hose connections with the correct hose clips (same as original equipment):*

⇒ Parts List

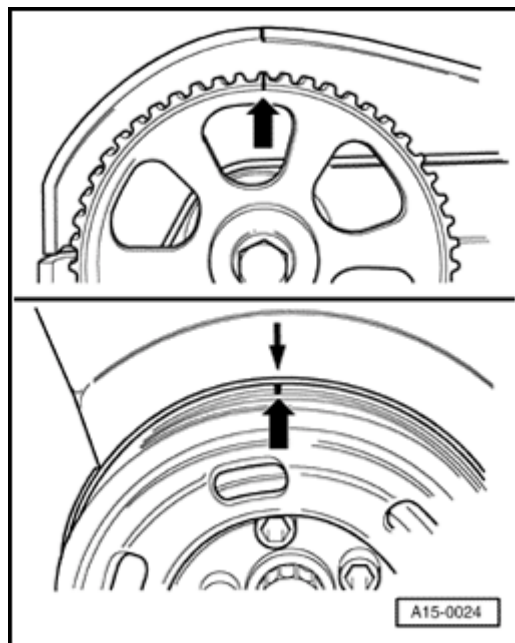
- ◆ *If repairing, carefully remove any remains of gasket material from the cylinder head and cylinder block. Make sure that no long scores or scratches are made on the surfaces.*
- ◆ *Carefully remove any remaining emery and abrasive material.*
- ◆ *Remove new cylinder head gasket from packaging, just before installation.*
- ◆ *Handle gasket extremely carefully. Damaging*

the silicone layer or the indented area will lead to leaks.

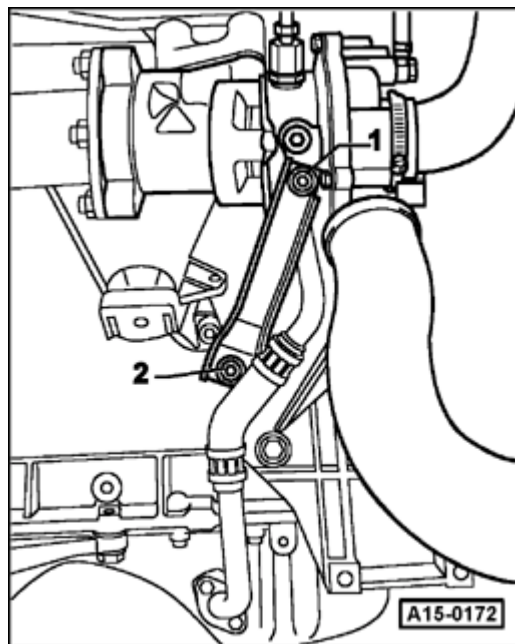
- ◆ *No oil or coolant must be allowed to remain in the blind holes for the cylinder head bolts in the cylinder head.*

A

- Before positioning cylinder head, set crankshaft and camshaft to TDC of cylinder 1.

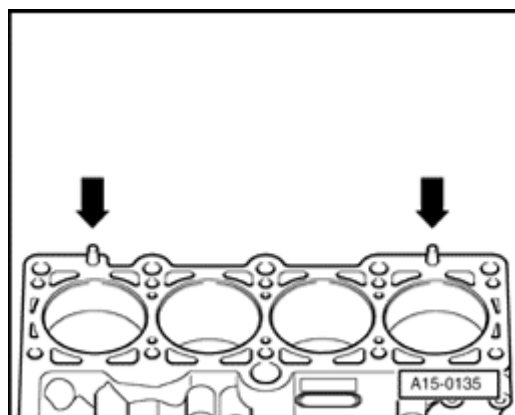


15-29



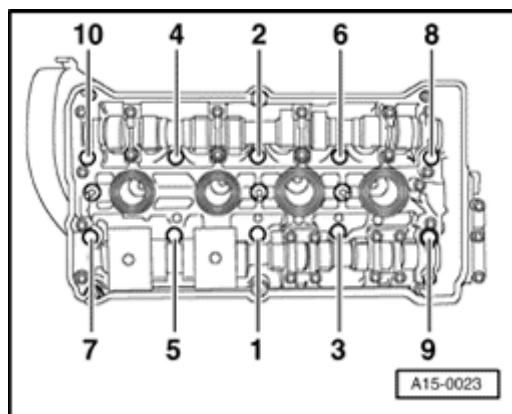
A

- Loosen bolts -1- and -2- on turbocharger bracket (about 2 full turns each) to avoid stressing when installing cylinder head.



A

- Place cylinder head gasket in position.
 - ◆ Note position of centralizing pins in cylinder block -arrows-.
 - ◆ Check installation position of cylinder head gasket. The Part No. should be legible from intake side.
- Position cylinder head.



- Insert cylinder head bolts and tighten by hand.
- Tighten cylinder head bolts in two stages in sequence shown as follows:
- Tighten using torque wrench:
 - ◆ Stage 1: 40 Nm
- Tighten with rigid wrench:
 - ◆ Stage 2: 180° ($\frac{1}{2}$ turn) further (2 turns of 90° further is permissible)

Note:

It is not necessary to retighten cylinder head bolts after repairs have been performed.

- Tighten exhaust turbocharger to exhaust manifold with new seal and attach bracket to cylinder block ⇒ [Page 21-45](#) .
- Install cylinder head cover ⇒ [Page 15-18](#) .
- Install toothed belt (adjust valve timing) ⇒ [Page 13-44](#) .

Note:

Observe all instructions on removing and installing the toothed belt ⇒ [Page 13-40](#) .

- Install ribbed belt and tensioner for ribbed belt ⇒ [Page 13-20](#) .
- Install intake line ⇒ [Page 15-13](#) .
- Replace coolant ⇒ [Page 19-7](#) .
- After connecting battery, enter anti theft code for radio.

⇒ *Radio operating instructions*

- Close windows fully using window switches.
- Actuate all power window switches again for at least one second in the "close" direction to activate the automatic open/close function.
- Set clock to correct time.
- Perform throttle-valve control module adaption:

⇒ [Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel](#)

[Injection & Ignition, Engine Code\(s\): AWM,
Repair Group 24](#)

Tightening torques

Component	Nm
Support for intake manifold to intake manifold	20
to bracket	20
Turbocharger to exhaust manifold	35 ¹⁾ 2)
Turbocharger bracket to cylinder block	25
Turbocharger bracket to turbocharger	30
Hose clamps for coolant hoses	2
Hose clamps for air duct hoses	3.5

¹⁾ Replace bolts

²⁾ Coat thread and head attachment area with high temperature lubricant G 052 112 A3

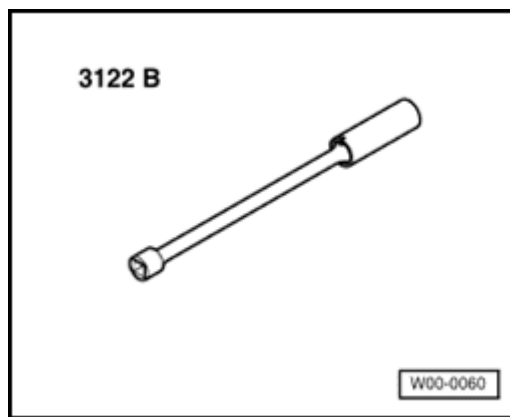
15-33

Compression, checking

Special tools and equipment



- ◆ Spark plug spanner 3122 B



- ◆ Compression tester VAG VAG 1763

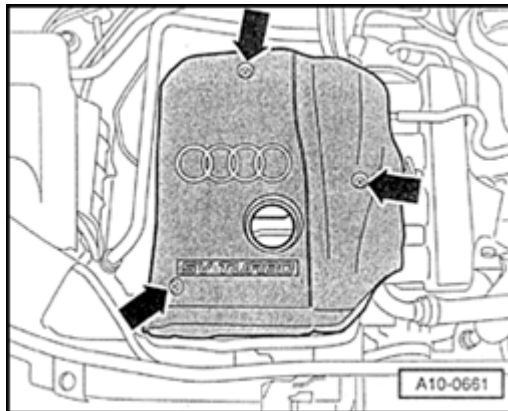


Test conditions:

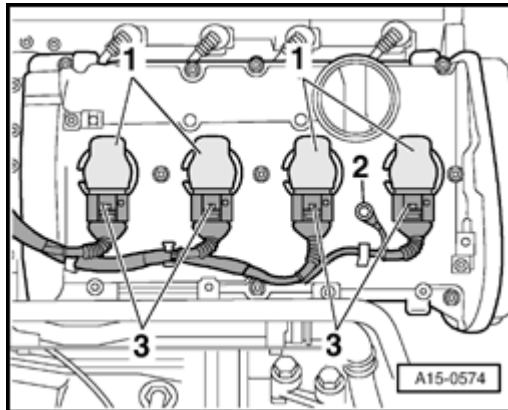
- Engine oil temperature at least 30 ° C
- Battery voltage at least 12.7 V

Test sequence

- Remove engine cover -arrows-.
- Switch ignition off.



- Disconnect connectors -3-.
- Remove ignition coils -1-.



- Remove spark plugs with spark plug spanner 3122B.
- Disconnect connectors from all injectors.
- Fully open throttle valve.
- Check compression with compression tester VAG VAG 1763.

Note:

Using the compression tester

⇒ *Operating instructions*

- Operate starter until tester shows no further pressure increase.

Compression pressure values:

New	Wear limit	Permissible difference between cylinders

		bar excess pressure
bar excess pressure	bar excess pressure	
9.0 to 14.0	7.5	max. 3.0

- Install spark plugs and ignition coils.

Note:

Replace gaskets for ignition coils if damaged.

- Check Diagnostic Trouble Code (DTC) memory:

⇒ [Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Engine Code\(s\): AWM , Repair Group 01](#)

Note:

DTCs will have been recorded in the DTC memory because the connectors have been unplugged. Check and, if necessary, erase the DTC memory after completing the test.

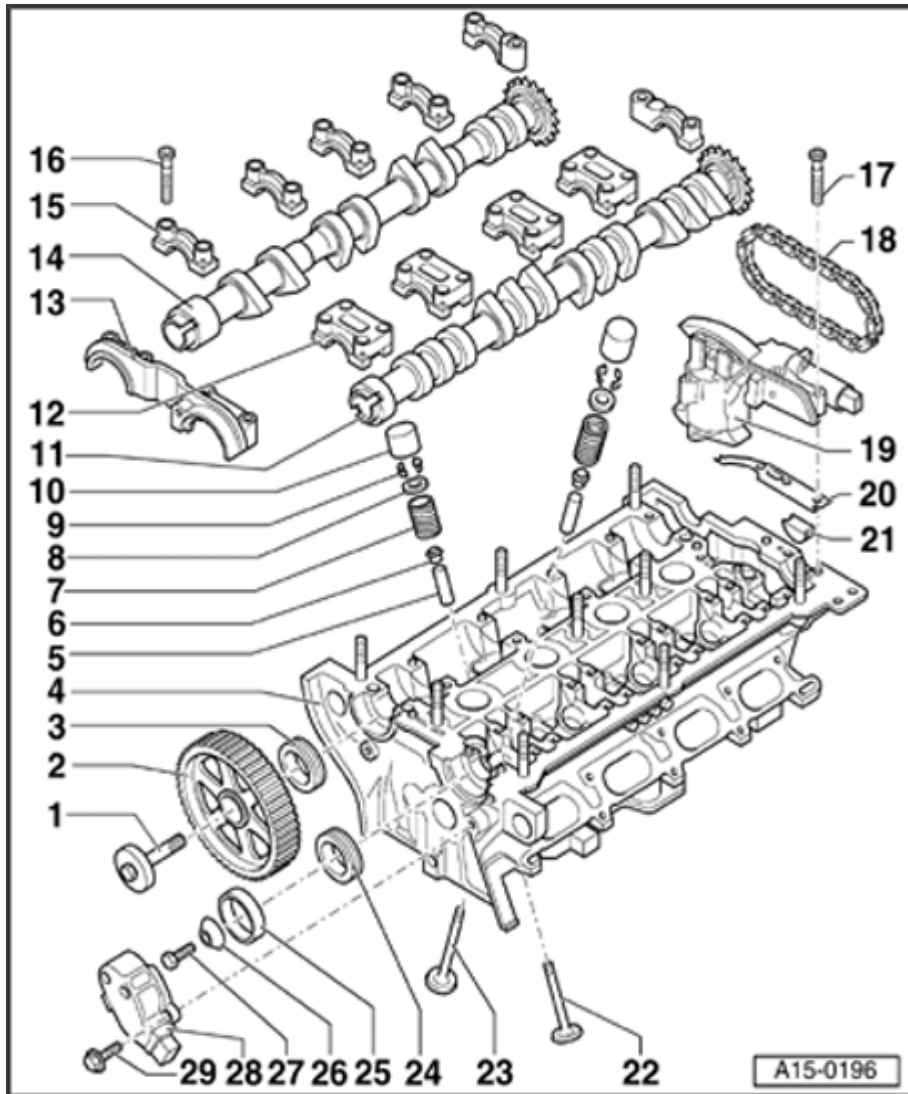
Tightening torques

Component	Nm
Spark plugs in cylinder head	30

Valve gear, servicing

Note:

- ◆ *Cylinder heads that have cracks between the valve seats or between valve seat inserts and the spark plug thread can be used further without reducing service life, provided the cracks do not exceed a maximum of 0.3 mm in width, or when no more than the first 4 turns of the spark plug threads are cracked.*
- ◆ *Wait about 30 minutes after installing the camshafts before starting the engine. Hydraulic valve compensation elements have to settle (otherwise valves will strike pistons).*
- ◆ *After working on the valve gear, turn the engine carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated.*
- ◆ *Replace all gaskets and seals.*



1 - 65 Nm

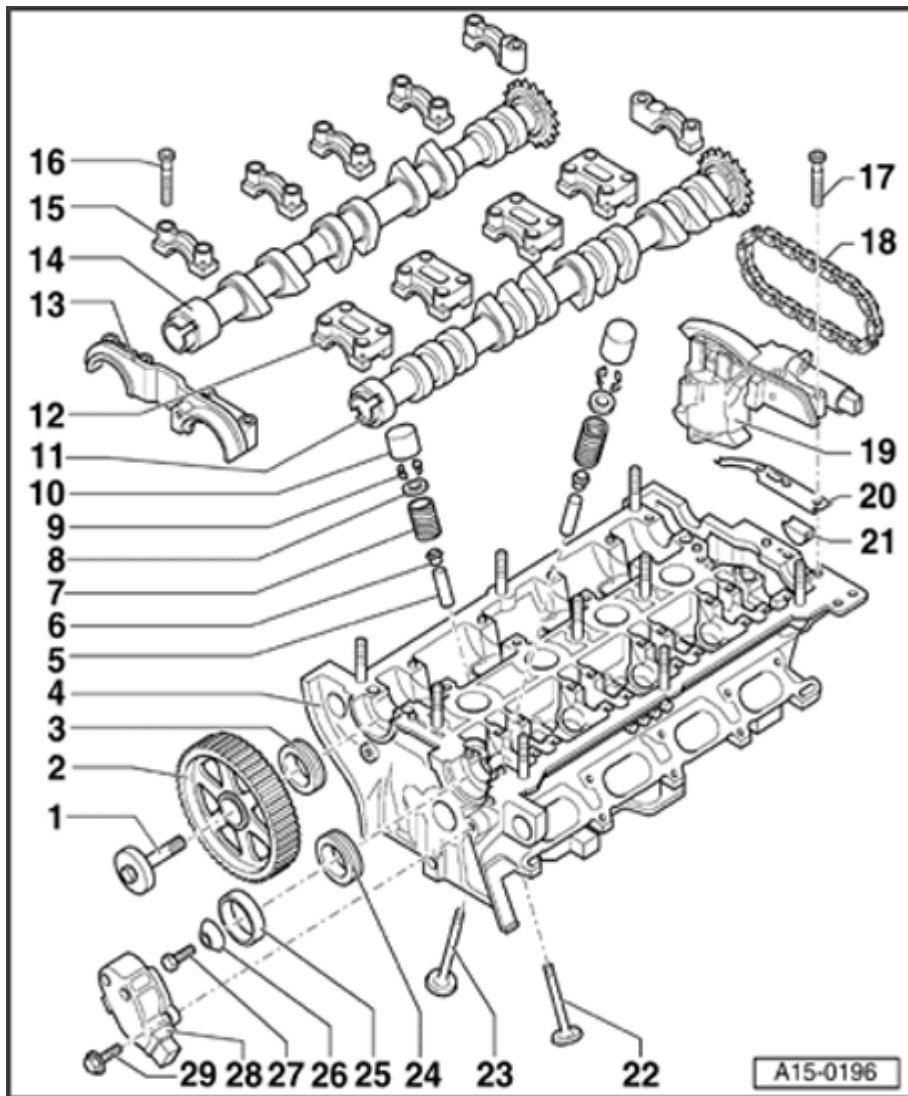
- ◆ Counterhold with 3036 to loosen and tighten

2 - Camshaft sprocket

- ◆ For exhaust camshaft
- ◆ Note correct installation position: The narrow web of the camshaft sprocket faces forward and the marking for No. 1 cylinder is visible from the front ⇒ [Page 15-55](#)

3 - Sealing ring

- ◆ For exhaust camshaft
- ◆ Replacing ⇒ [Page 15-50](#)



4 - Cylinder head

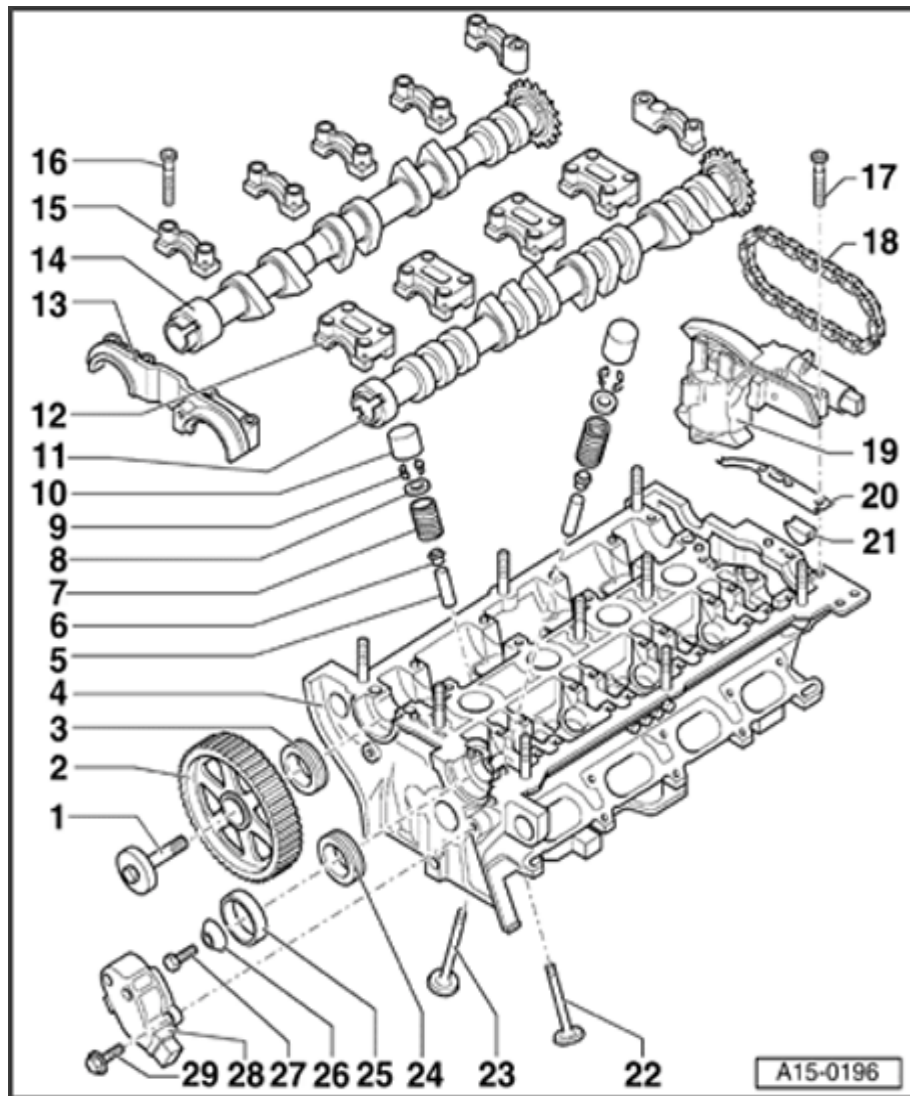
- ◆ See note ⇒ [Page 15-37](#)
- ◆ Checking valve guides ⇒ [Page 15-86](#)
- ◆ Reworking valve seats ⇒ [Page 15-88](#)
- ◆ Dowel sleeves for bearing caps must be located in cylinder head.
- ◆ Seal joints ⇒ Fig. ⇒ [3](#) and Fig. ⇒ [4](#) , ⇒ [Page 15-8](#)

5 - Valve guide

- ◆ Checking ⇒ [Page 15-86](#)

6 - Valve stem seal

- ◆ Replacing ⇒ [Page 15-77](#)



7 - Valve springs

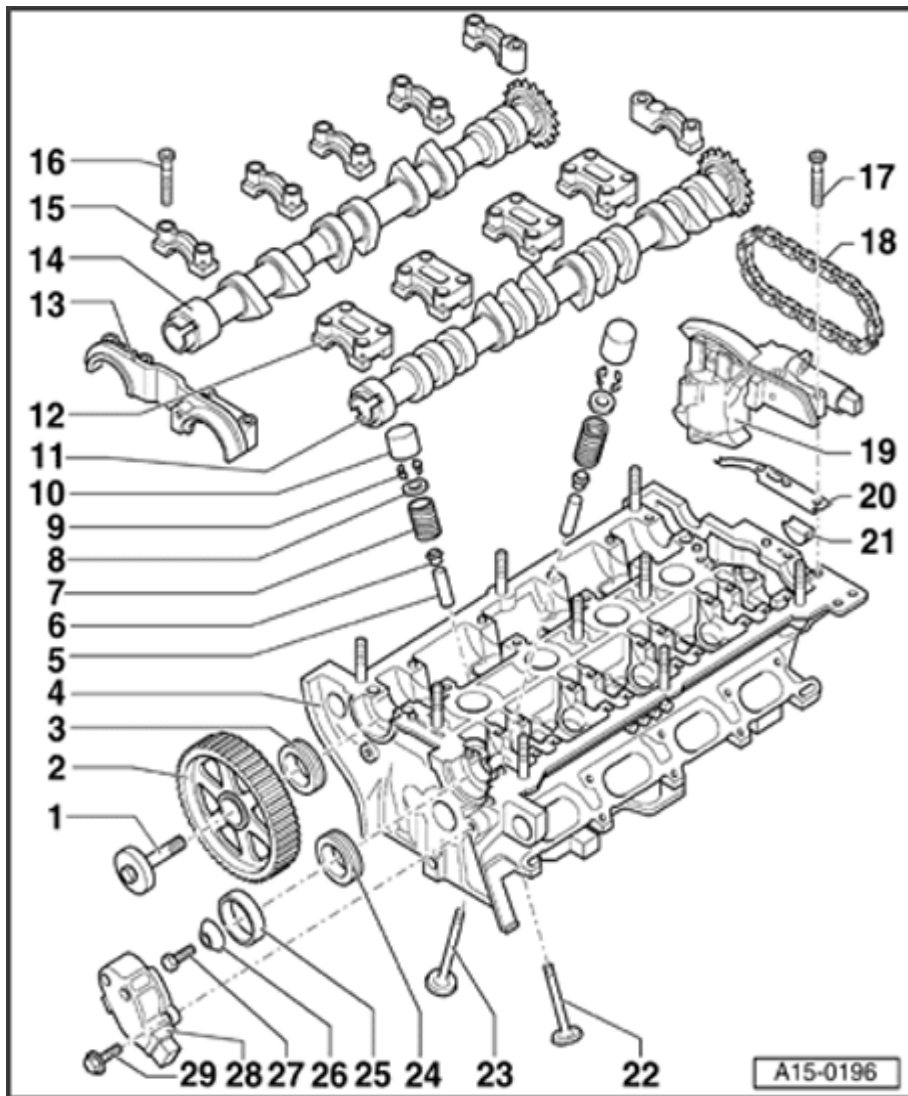
- ◆ Removing and installing ⇒ [Page 15-77](#)

8 - Valve spring plate

9 - Valve keepers

10 - Hydraulic valve lifter

- ◆ Checking ⇒ [Page 15-74](#)
- ◆ Removing and installing ⇒ [Page 15-77](#)
- ◆ Do not interchange
- ◆ Store with cam contact surface downward
- ◆ Before installing check camshaft axial clearance ⇒ [Page 15-48](#)
- ◆ Oil contact surface

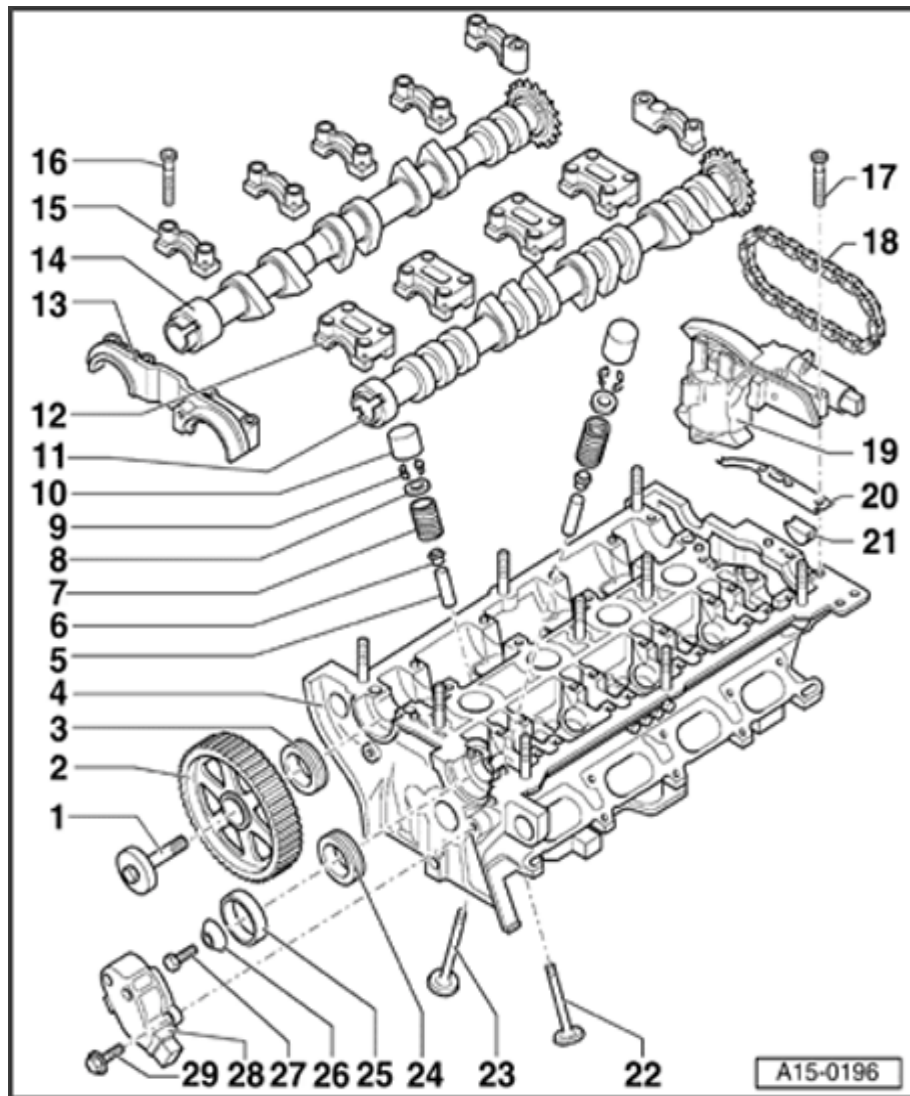


11 - Intake camshaft

- ◆ Check radial clearance with PlastigageTM (hydraulic lifters not installed). Wear limit: 0.1 mm
- ◆ Run-out: no more than 0.035 mm
- ◆ Checking axial clearance ⇒ [Page 15-48](#)
- ◆ Removing and installing camshafts ⇒ [Page 15-62](#)

12 - Bearing cap for intake camshaft

- ◆ Must be located on dowel sleeves
- ◆ Dowel sleeves must be located in cylinder head.
- ◆ Note installation position
- ◆ Installation sequence ⇒ [Page 15-67](#)

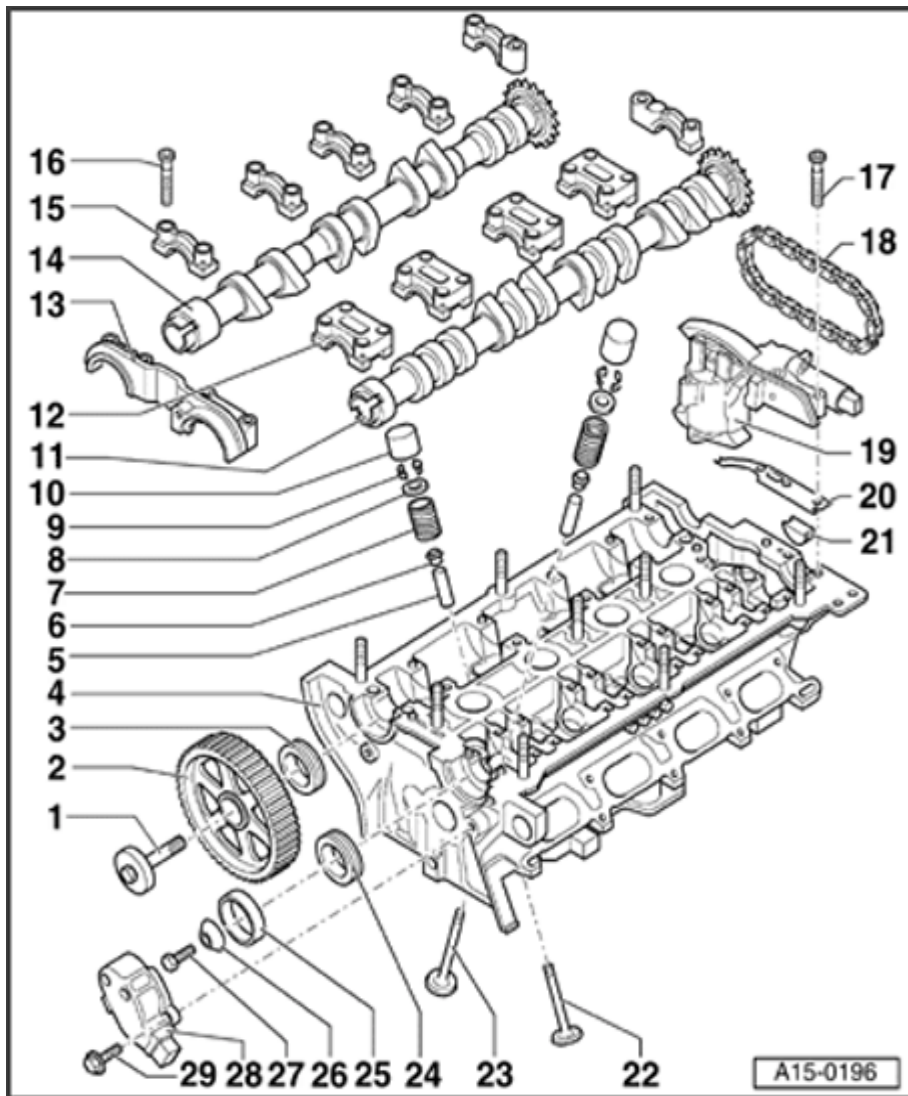


13 - Double bearing cap

- ◆ Must be located on dowel sleeves
- ◆ Dowel sleeves must be located in cylinder head
- ◆ Coat sealing surface lightly with AMV 188 001 02 before installation ⇒ [Page 15-71](#)
- ◆ Seal connections between double bearing cap and cylinder head ⇒ Fig. ⇒ [3](#) , ⇒ [Page 15-8](#)

14 - Exhaust camshaft

- ◆ Check radial clearance with Plastigage[™] (hydraulic lifters not installed). Wear limit: 0.1 mm
- ◆ Run-out: no more than 0.035 mm
- ◆ Checking axial clearance ⇒ [Page 15-48](#)
- ◆ Removing and installing camshafts ⇒ [Page 15-62](#)



15 - Bearing cap for exhaust camshaft

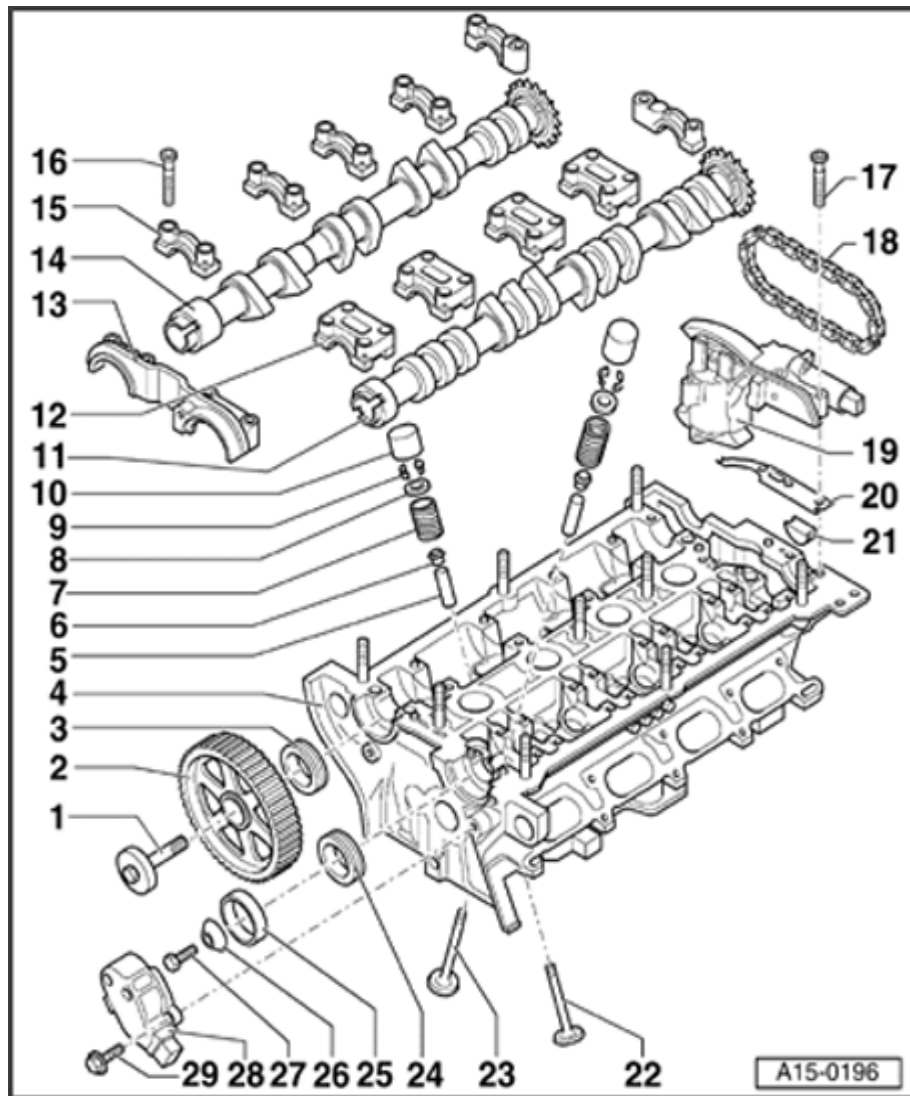
- ◆ Must be located on dowel sleeves
- ◆ Dowel sleeves must be located in cylinder head
- ◆ Note installation position
- ◆ Installation sequence ⇒ [Page 15-67](#)

16 - 10 Nm

17 - 10 Nm

18 - Drive chain

- ◆ Check for wear
- ◆ Before removing, mark installation position
⇒ [Page 15-66](#)
- ◆ Removing and installing camshaft ⇒ [Page 15-62](#)



19 - Camshaft adjuster

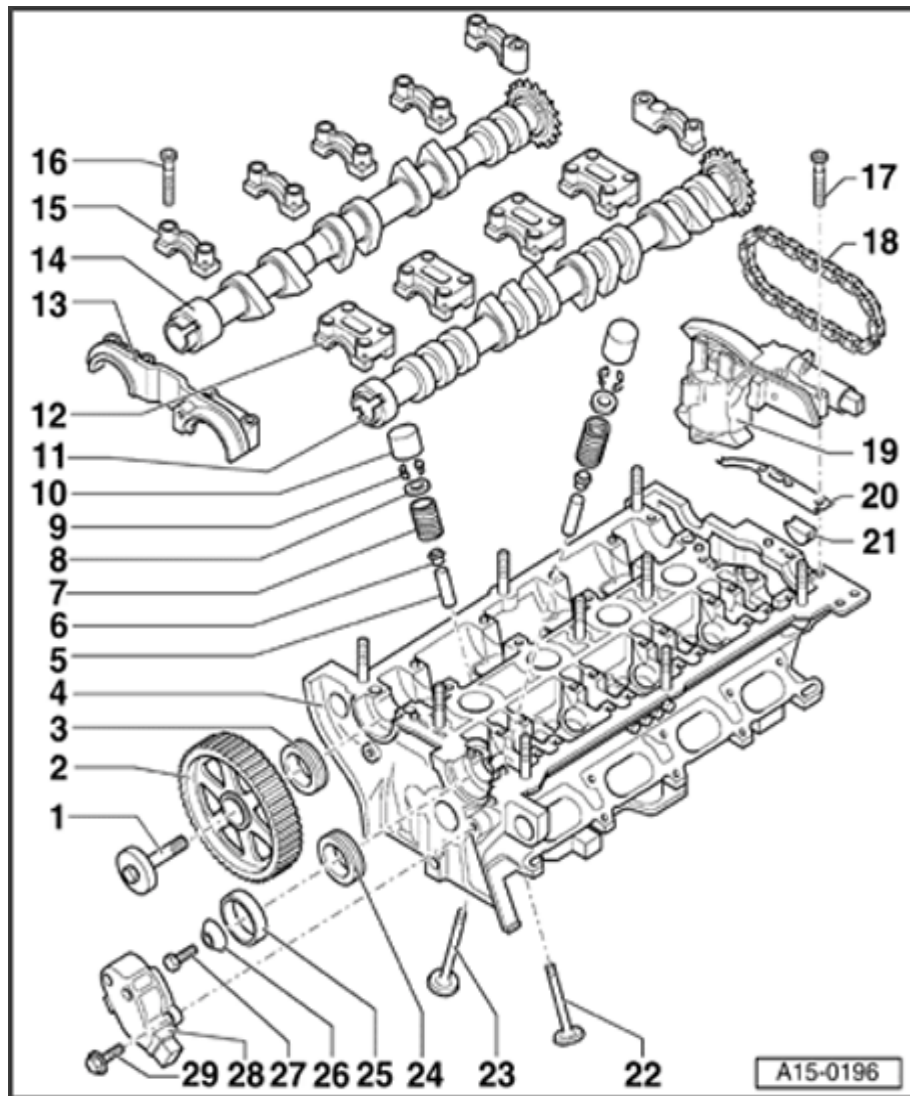
- ◆ With solenoid valve for camshaft adjustment -N205-
- ◆ Checking ⇒ [Page 15-92](#)
- ◆ Hold in position with retainer for chain tensioner 3366 before removing
- ◆ Removing and installing ⇒ [Page 15-62](#)
- ◆ Seal sides of joints between camshaft adjuster and cylinder head ⇒ Fig. ⇒ [4](#) , ⇒ [Page 15-8](#)

20 - Metal/rubber gasket

- ◆ Before installation coat sealing surface lightly with AMV 188 001 02 ⇒ [Page 15-67](#)

21 - Gasket

- ◆ Always replace

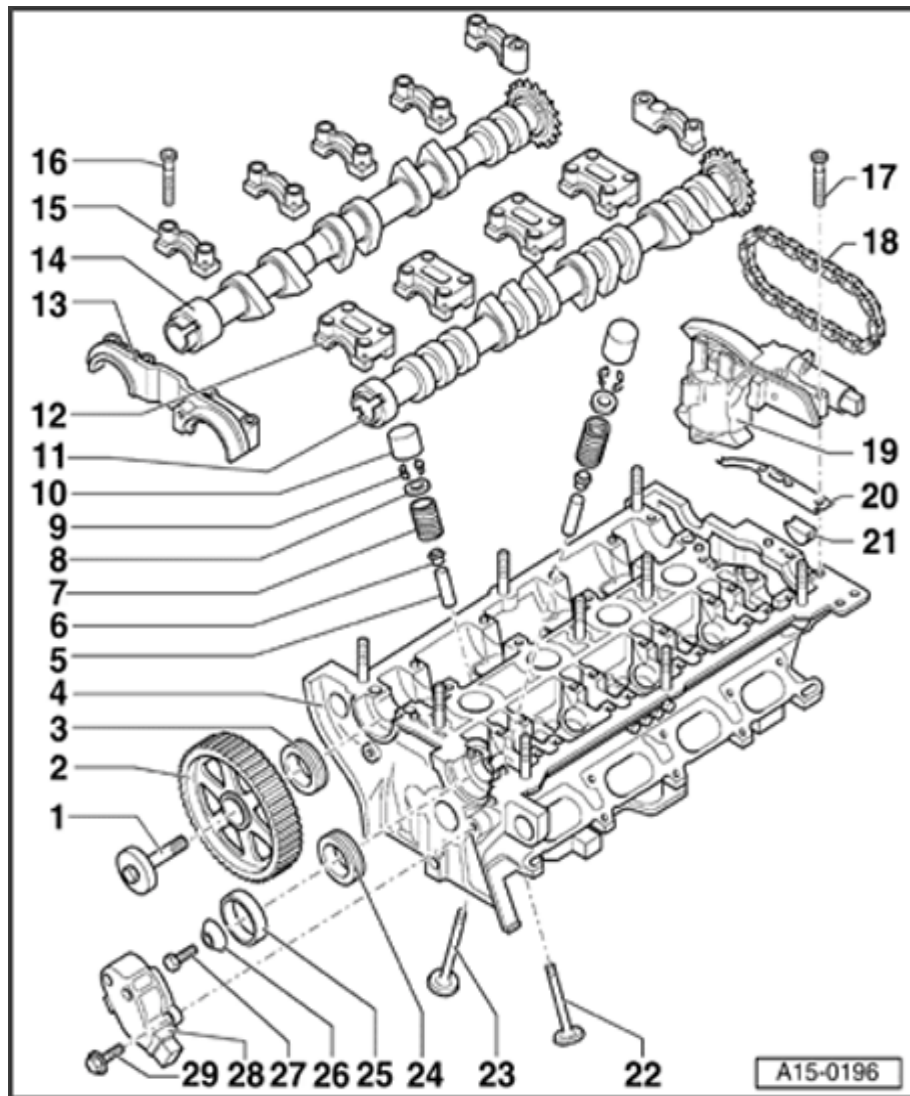


22 - Exhaust valve

- ◆ With sodium filling
- ◆ Note instructions on scrapping valves with a sodium filling ⇒ [Page 15-47](#)
- ◆ Do not rework, only lapping in is permitted
- ◆ Valve dimensions ⇒ Fig. ⇒ [1](#) , ⇒ [Page 15-47](#)
- ◆ Checking valve guides ⇒ [Page 15-86](#)
- ◆ Reworking valve seats ⇒ [Page 15-88](#)

23 - Intake valve

- ◆ Do not rework, only lapping in is permitted
- ◆ Valve dimensions ⇒ Fig. ⇒ [1](#) , ⇒ [Page 15-47](#)
- ◆ Checking valve guides ⇒ [Page 15-86](#)
- ◆ Reworking valve seats ⇒ [Page 15-88](#)

**24 - Sealing ring**

- ◆ For intake camshaft
- ◆ Replacing ⇒ [Page 15-57](#)

25 - Rotor for Camshaft Position sensor

- ◆ Note correct installation position: Insert tab in notch of camshaft

26 - Washer

- ◆ With cone
- ◆ Note installation position

27 - 25 Nm**28 - Housing for Camshaft Position sensor - G40-****29 - 10 Nm**

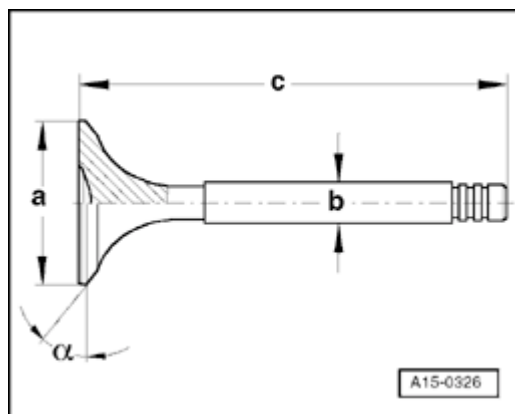


Fig. 1 Valve dimensions

Note:

Intake and exhaust valves must not be reworked. Only lapping in is permitted.

Dimension		Intake valve	Exhaust valve
Diameter -a-	mm	26.80 to 27.00	29.80 to 30.00
Diameter -b-	mm	5.95...5.97	5.94 to 5.95
-c-	mm	104.84 to 105.34	103.64 to 104.14
α	$\angle^\circ$	45	45

CAUTION!

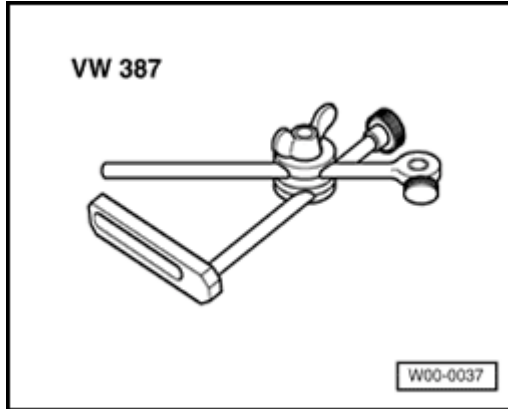
- ♦ **Worn exhaust valves with sodium filling must not be disposed of until they have been treated as follows:**
- ♦ **The valves must be sawn into two sections with a metal saw at a point between the center of the shaft and the valve head. They must not come into contact with water while this is done. Then throw the valves into a bucket of water (not more than ten at a time). Step back immediately because a chemical reaction occurs when the sodium filling burns.**
- ♦ **After this treatment the valves can be disposed of in the normal way.**

Camshaft axial clearance, checking

Special tools and equipment



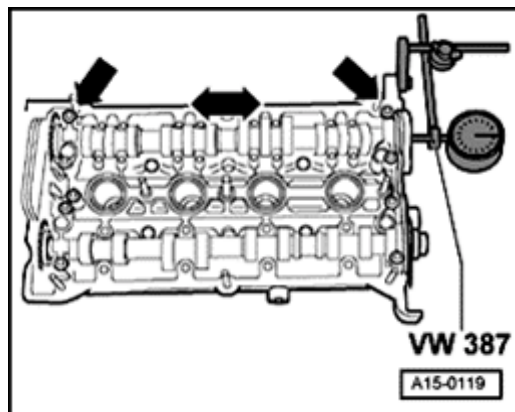
- ◆ Universal dial indicator bracket VW 387
- ◆ Dial indicator



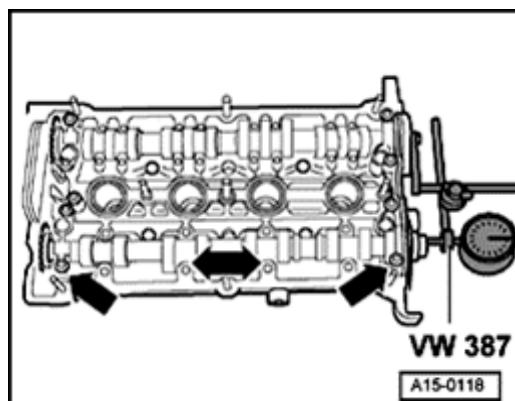
Test sequence

Perform measurement with hydraulic lifters removed and with bearing cap at chain sprocket end and double bearing cap at camshaft sprocket end installed.

- Attach dial indicator with universal dial indicator holder VW 387 to cylinder head:



◀ Intake camshaft

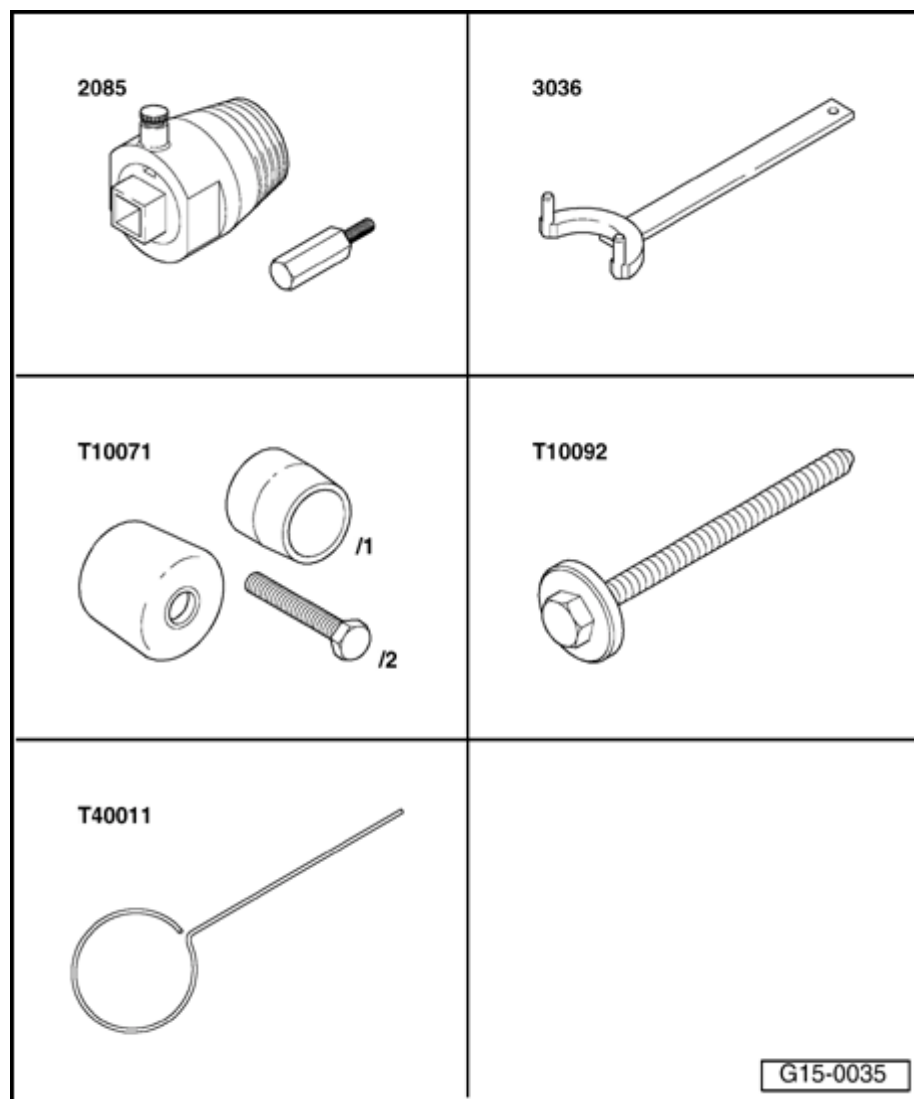


◀ Exhaust camshaft

Wear limit for intake and exhaust camshafts.

- Axial clearance: no more than 0.20 mm

15-50



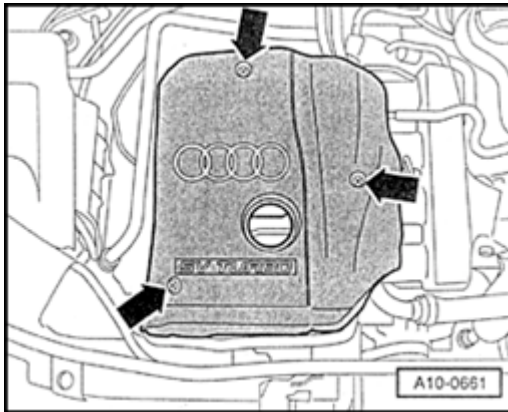
Exhaust camshaft oil seal, replacing

Special tools and equipment

- ◆ Oil seal extractor 2085
- ◆ Holding tool 3036
- ◆ Assembly tool T10071
- ◆ Socket head fastener T10092
- ◆ Pin T40011

Removing

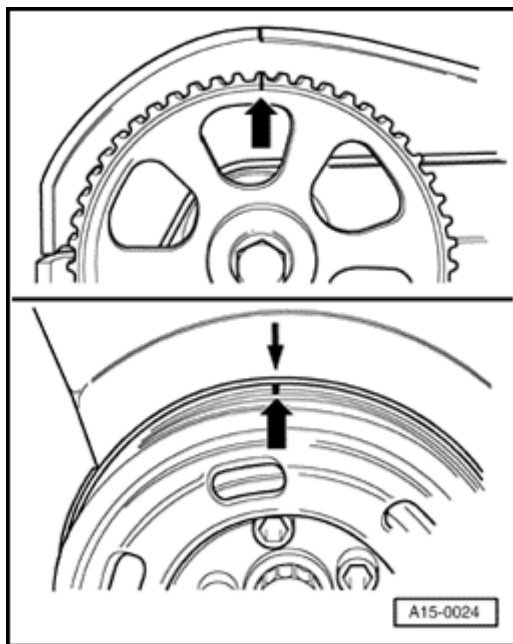
- Cylinder head installed
- Lock carrier must be in service position ⇒ [Page 13-1](#) .



A

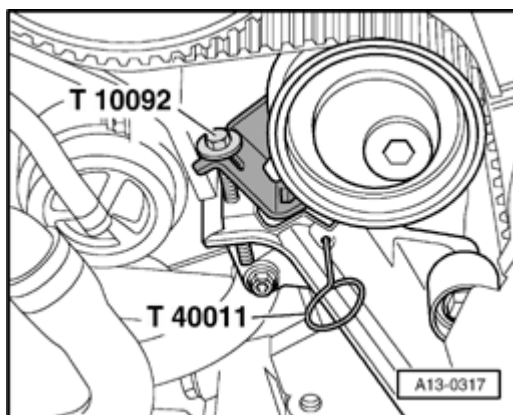
- Remove engine cover -arrows-.
- Remove upper toothed belt guard ⇒ [Page 13-35](#) .

15-52



A

- Set crankshaft to markings for TDC of No. 1 cylinder by turning central bolt on crankshaft sprocket in direction of rotation -arrows-.



A

- Attach socket head fastener T10092 into tensioner for toothed belt.

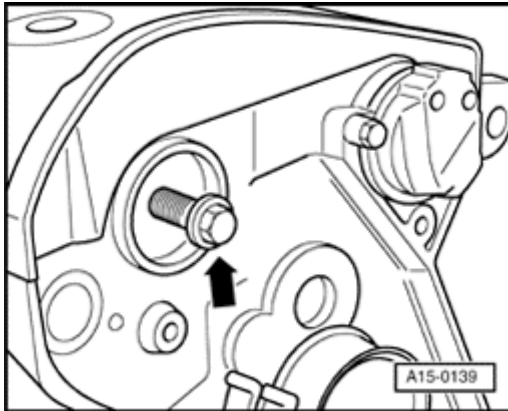
Note:

Only tension piston of tensioner until pressure piston is secured with pin T40011.

- Take toothed belt off camshaft sprocket.

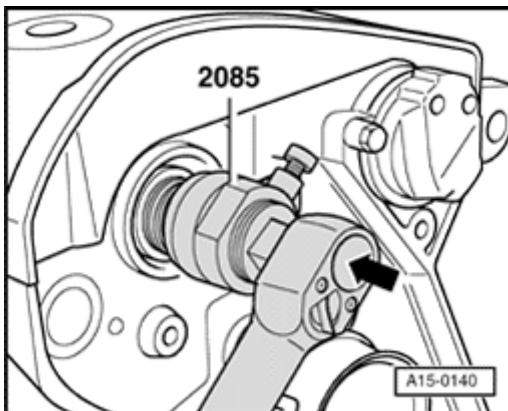
- Loosen camshaft sprocket (counter hold with 3036).

- Remove camshaft sprocket.



A

- To guide oil seal extractor, thread securing bolt for camshaft sprocket - arrow- into camshaft as far as it will go by hand.
- Adjust inner part of oil seal extractor 2085 two turns (approx. 3 mm) from outer part and lock in position with knurled screw.



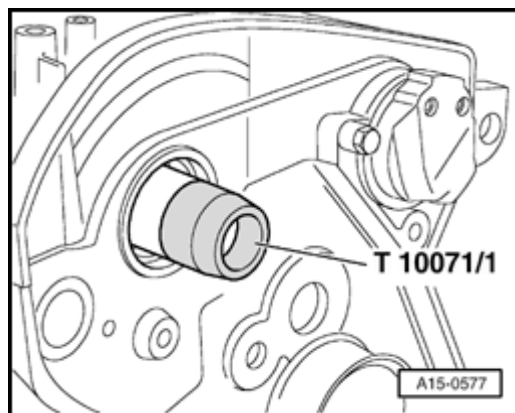
A

- Lubricate threaded head of oil seal extractor 2085, place it in position and, exerting firm pressure, screw it into oil seal as far as possible.
- Loosen knurled screw and turn inner part of extractor against camshaft until oil seal has been extracted.
- Clamp flats of oil seal extractor in vice. Remove oil seal with pliers.

Installing

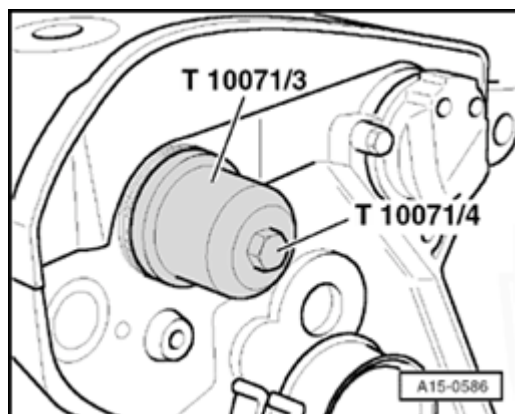
Note:

Do not oil sealing lip of oil seal.



A

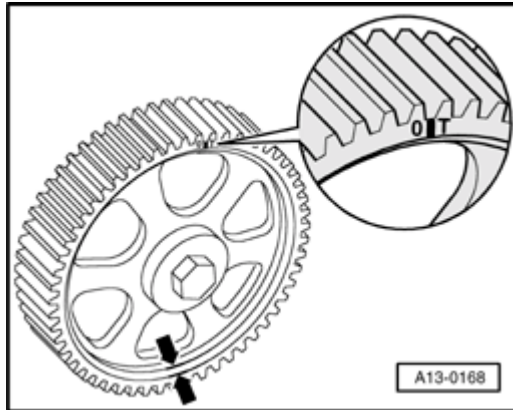
- Place guide sleeve T10071/1 onto crankshaft journal.
- Push sealing ring via guide sleeve onto shaft journal.
- Remove guide sleeve.



A

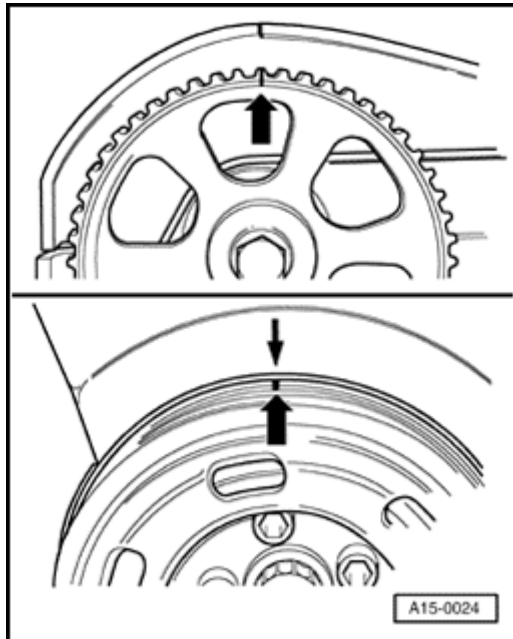
- Press in sealing ring with pressure sleeve T10071/3 and bolt T10071/4.

15-55



A

- Install camshaft sprocket.
 - ◆ Note correct installation position: Narrow web of camshaft sprocket faces outward -arrows- and marking for No. 1 is visible from front.
- Install securing bolt for camshaft sprocket (use counter hold tool 3036).



A

- Align markings on camshaft sprocket with marking on cylinder head cover.
- Align marking on vibration damper with marking on lower part of toothed belt guard.

Note:

If a piston is at TDC the valves could strike the piston when turning the camshaft. To avoid damage to valves and pistons the pistons must not be at TDC.

- Install toothed belt (adjust valve timing) ⇒ [Page 13-44](#) .

Note:

Observe all instructions on removing and installing the toothed belt ⇒ [Page 13-40](#) .

Tightening torque

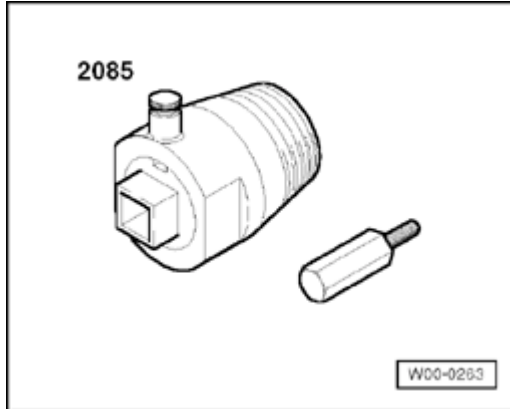
Component	Nm
Camshaft sprocket to camshaft	65

Intake camshaft seal, replacing

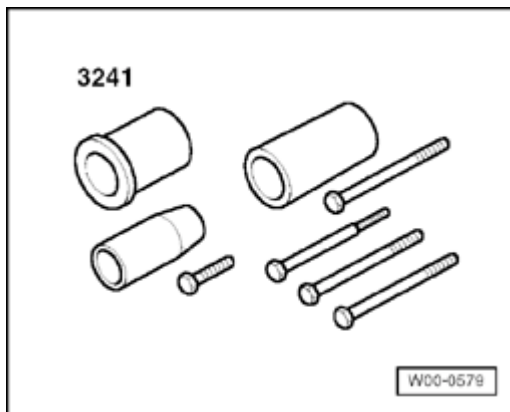
Special tools and equipment



- ◆ Oil seal extractor 2085

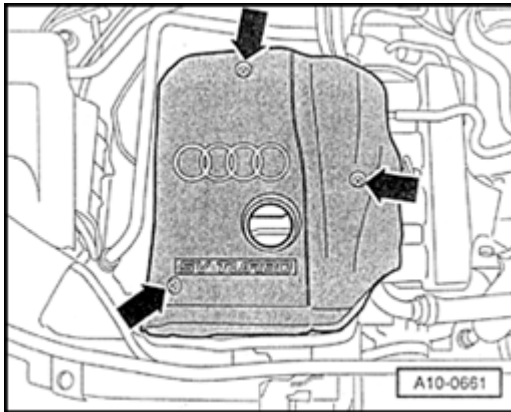


- ◆ Installation tool 3241

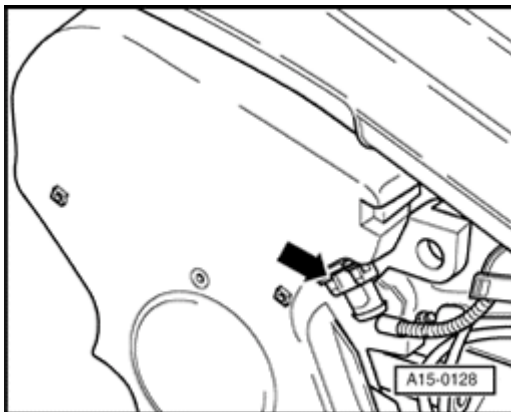


Removing

- Cylinder head installed
- Lock carrier must be in service position ⇒ [Page 13-1](#) .

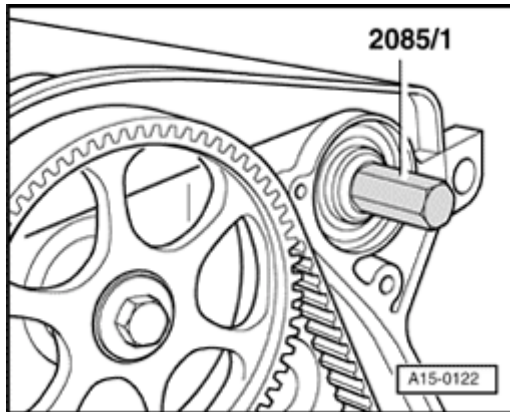


- Remove engine cover -arrows-.
- Remove upper toothed belt guard ⇒ [Page 13-35](#) .



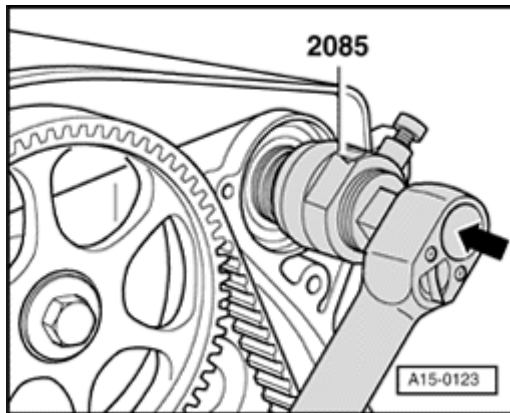
- Disconnect connector from camshaft position sensor -arrow-.
- Remove sensor housing.
- Remove sensor rotor and washer.

15-59



A

- Insert camshaft sprocket bolt 2085/1 by hand into camshaft as far as it will go.
- Adjust inner part of oil seal extractor 2085 two turns (approx. 3 mm) from outer part and lock in position with knurled screw.



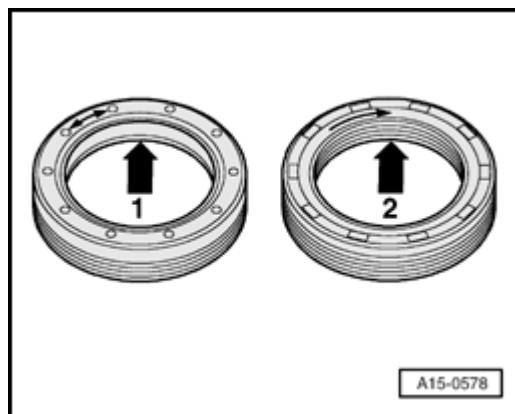
A

- Lubricate threaded head of oil seal extractor 2085, place it in position and, exerting firm pressure, screw it into oil seal as far as possible.
- Loosen knurled screw and turn inner part of extractor against camshaft until oil seal has been extracted.

Installing

Note:

- ◆ Production variations may have the shaft sealing rings with ring spring or PTFE sealing rings used at the intake camshaft.
- ◆ Difference: The regular shaft sealing ring has only one sealing lip - arrow 1- which is tensioned by a spring. The PTFE sealing ring has a thread-like sealing area -arrow 2- but no spring.
- ◆ When installing, the sealing surface of the PTFE sealing ring must not be stretched. For this reason it is not permitted to install the PTFE sealing ring together with the guide sleeve for sealing rings with spring.
- ◆ The PTFE sealing rings must be aligned to the rotation direction of the shaft (see arrow marking on sealing ring). The wrong rotation direction causes oil leakage.



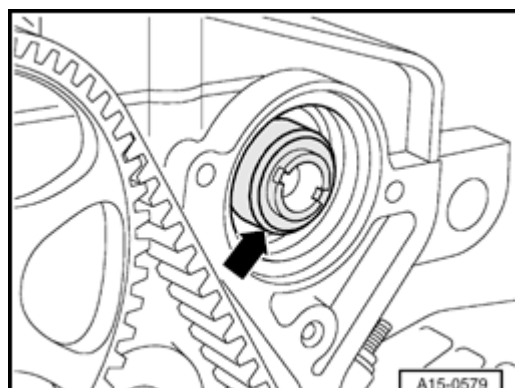
Installing PTFE sealing ring:

- Check edge of chamfer -arrow- on shaft end of intake camshaft for burrs or sharp edges. If necessary, smooth edge with an oil stone.

Note:

Do not oil sealing lip of oil seal.

- Push PTFE sealing ring carefully onto shaft end by hand.



Installing sealing ring with spring:

Note:

Do not oil sealing lip of oil seal.

A

- Place guide sleeve 3241/2 onto camshaft journal.
- Slide oil seal over guide sleeve.

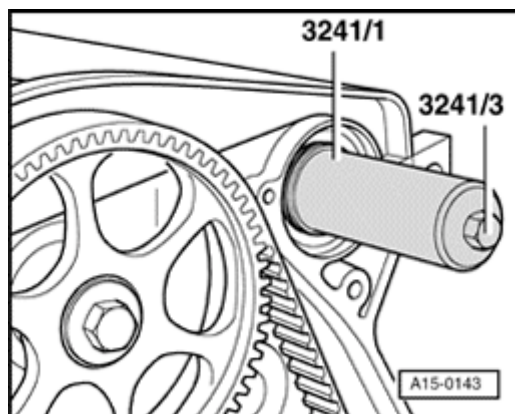
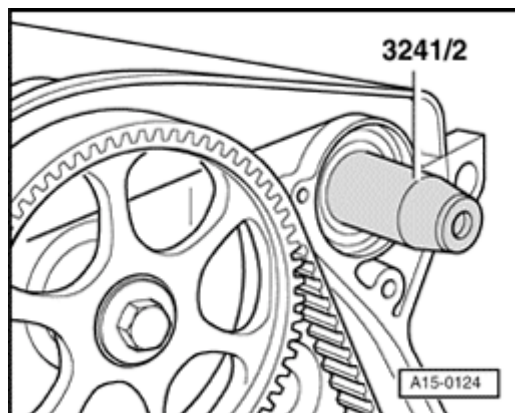
All models:

A

- Press in sealing ring with pressure sleeve 3241/1 as far as it will go. To do this use bolt 3241/3.
- Install camshaft position sensor ⇒ [Page 15-46](#) .
- Install toothed belt guard (upper section).
- Install lock carrier ⇒ [Page 13-1](#) .

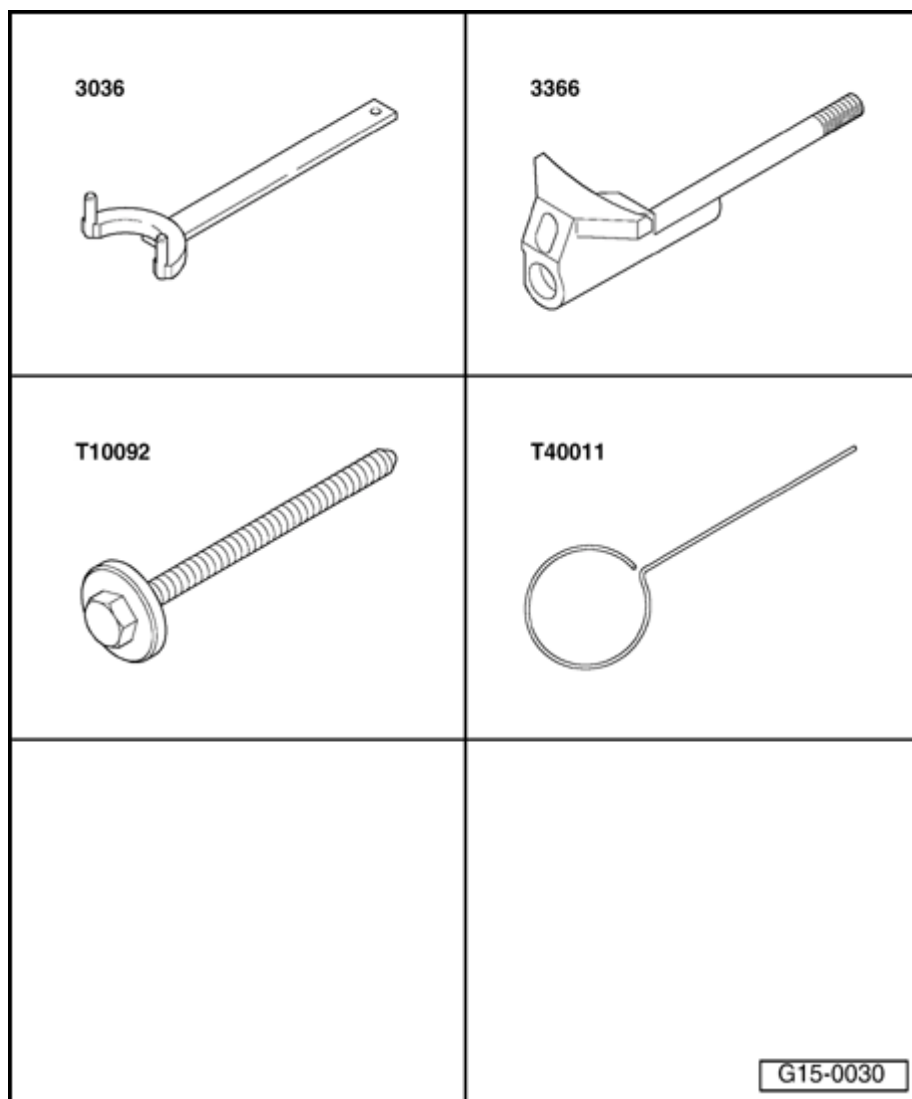
Tightening torques

Component	Nm
Camshaft position sensor rotor to camshaft	25



Camshaft position sensor housing to cylinder head	10

15-62



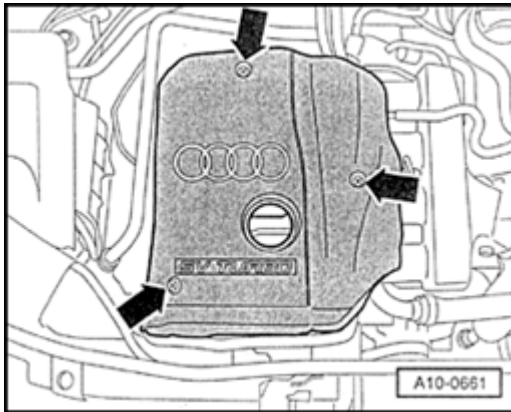
Camshafts and camshaft adjuster, removing and installing

Special tools and equipment

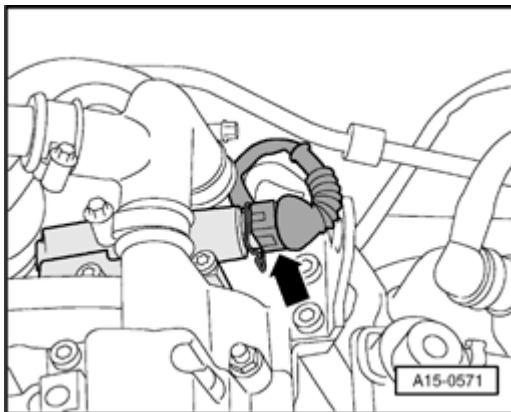
- ◆ Holding tool 3036
- ◆ Retainer for chain tensioner 3366
- ◆ Tensioning screw T10092
- ◆ Guide pin T40011

Removing

- Cylinder head installed
- Lock carrier must be in service position ⇒ [Page 13-1](#) .

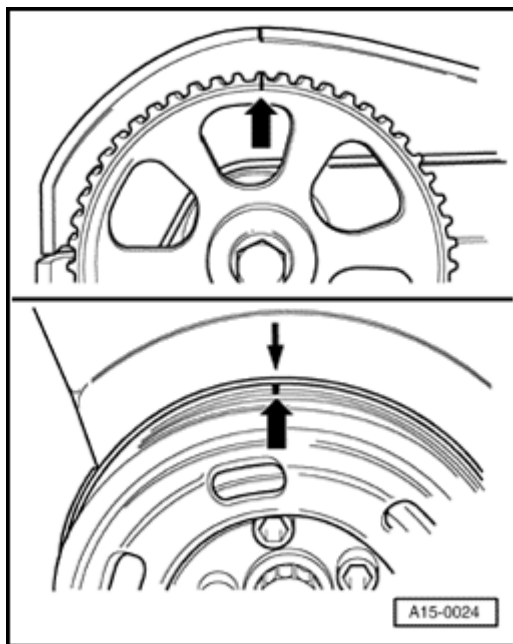


- Remove engine cover -arrows-.
- Remove combination valve for secondary air inlet ⇒ [Page 26-64](#) .



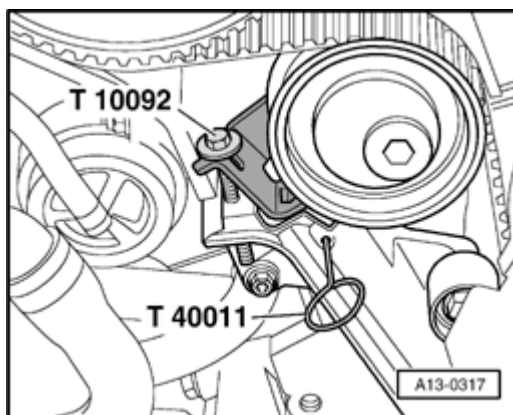
- Disconnect connector -arrow- from camshaft adjuster.
- Remove upper toothed belt guard ⇒ [Page 13-35](#) .

15-64



A

- Set crankshaft to markings for TDC of No. 1 cylinder by turning central bolt on crankshaft sprocket in direction of rotation -arrows-.
- Remove cylinder head cover ⇒ [Page 15-15](#) .



A

- Thread socket head fastener T10092 into tensioner for toothed belt.
- Tension pressure piston of tensioner until piston is secured with pin T40011.
- Remove toothed belt from camshaft sprocket.

- Loosen camshaft sprocket (counter hold with 3036).

- Remove camshaft sprocket.

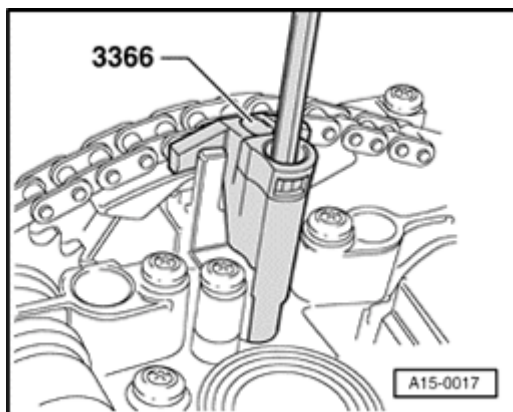
- Remove camshaft position sensor completely.



- Hold camshaft adjuster in position with retainer for chain tensioner 3366.

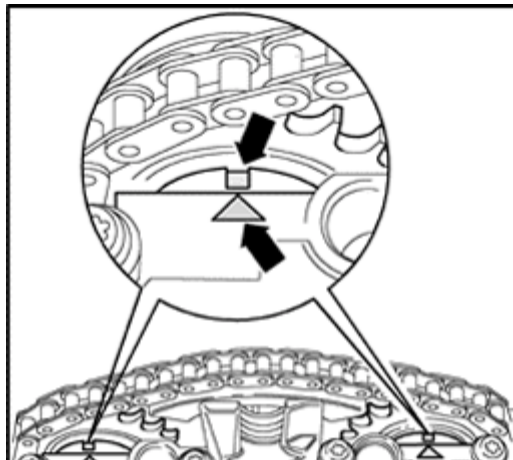
Note:

If the retainer for chain tensioner is tightened excessively, this can damage the camshaft adjuster.

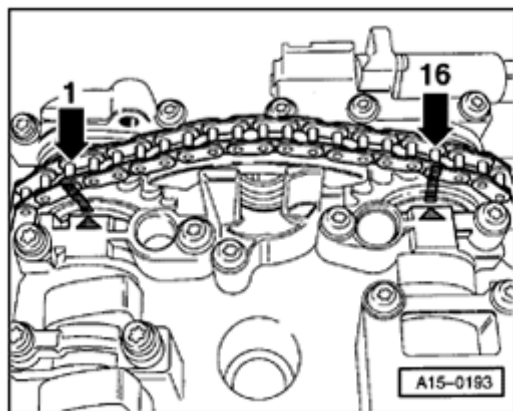


- Re-check TDC position of camshafts.

- ◆ Marks on two camshafts must be in line with arrows on bearing caps.



- Clean chain and camshaft sprockets opposite two arrows on bearing caps and mark installation position with color marks.

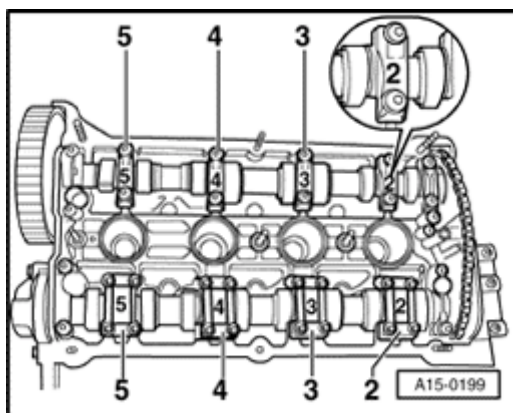


A

- ◆ Distance between two arrows or color markings are 16 rollers on drive chain.
- ◆ Notch on exhaust camshaft is offset slightly toward inside in relation to chain roller -1-.

Note:

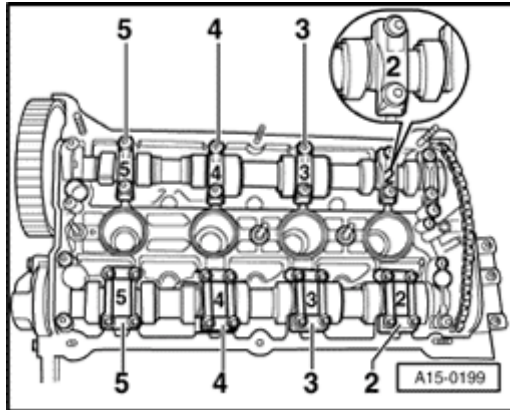
Do not mark chain with a center punch or by making a notch or similar marking.



A

- Remove bearing caps 3 and 5 on intake and exhaust camshafts.
- Remove double bearing cap.
- Remove both bearing caps next to intake and exhaust camshaft chain sprockets.
- Remove securing bolts for camshaft adjuster.

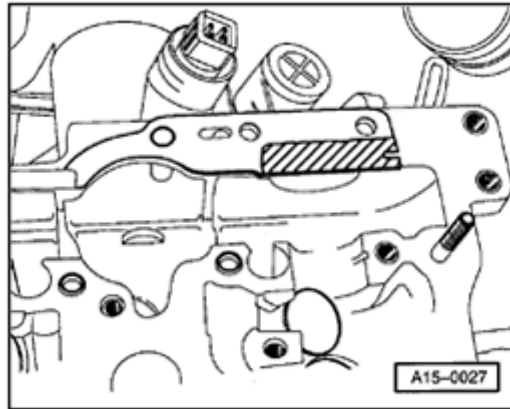
15-67



A

- Loosen bearing caps 2 and 4 of intake and exhaust camshafts alternately and diagonally, and remove.
- Remove intake and exhaust camshafts with camshaft adjuster.

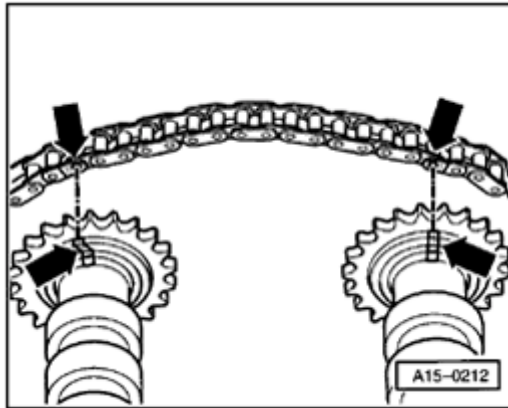
Installing



A

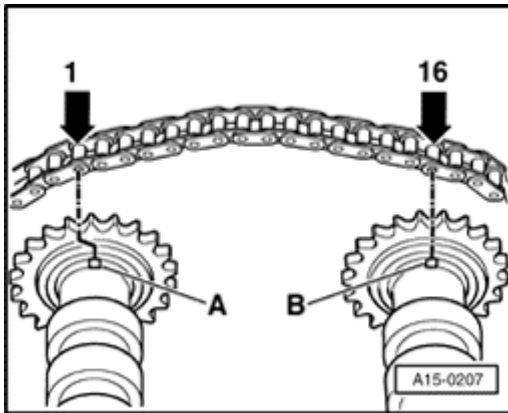
- Replace rubber/metal gasket for hydraulic chain tensioner and apply a thin coat of sealant AMV 188 001 02 to shaded area.

- Install drive chain on camshaft sprockets as follows:



A

- ◆ When old chain is being re-installed, install so that colored markings are in line -arrows-.



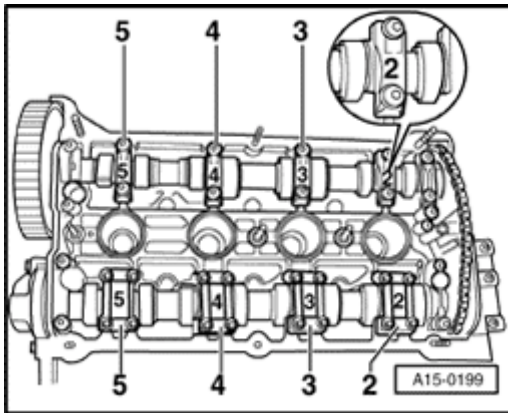
A

- ◆ When a new chain is being installed, distance between notches -A- and -B- on camshafts must be 16 rollers on chain. The illustration shows exact positions of 1st and 16th rollers on sprockets.
- ◆ Notch -A- is offset slightly toward inside in relation to chain roller -1-.
- Push camshaft adjuster between drive chain (2nd mechanic required).

- Position camshafts together with drive chain and camshaft adjuster on cylinder head.
- Oil running surfaces of both camshafts.

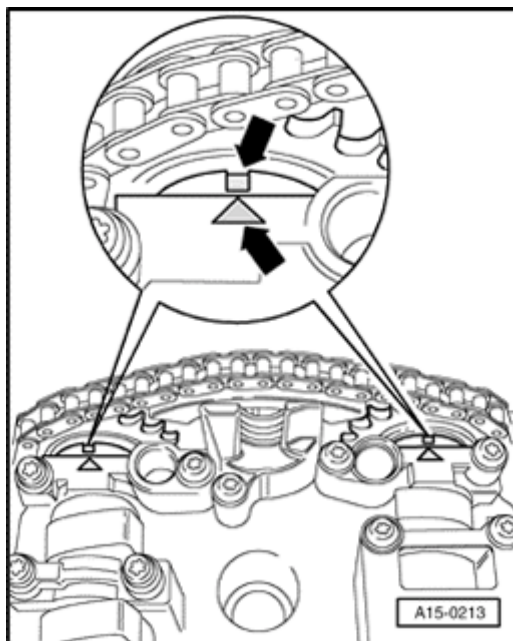
Note:

- ◆ *Dowel sleeves for bearing caps and camshaft adjuster must be located in cylinder head.*
- ◆ *When installing bearing caps ensure that the identification mark is readable from the intake side of the cylinder head.*
- Tighten mountings of camshaft adjuster (watch position of dowel sleeves).
- Tighten bearing caps 2 and 4 of intake and exhaust camshafts in stages and in diagonal sequence (watch position of dowel sleeves).
- Install two bearing caps next to chain sprockets on intake and exhaust camshafts.

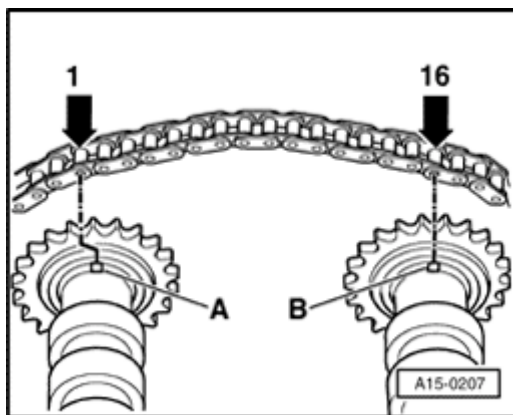
**A**

15-70

- Check correct setting of camshafts:

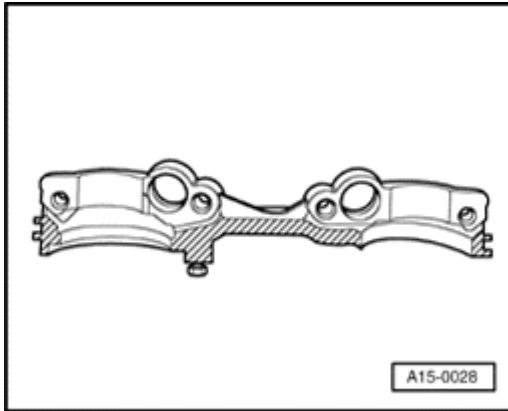


- Two markings on camshafts must be in line with two arrows on bearing caps -arrows-.



- Distance between two arrows on bearing caps or color markings are 16 rollers on drive chain.
- Notch on exhaust camshaft is offset slightly toward inside in relation to chain roller -1-.

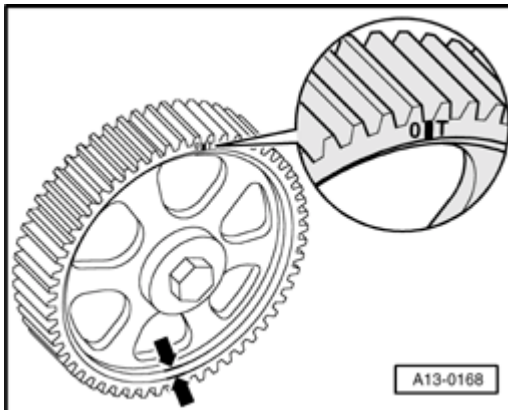
15-71



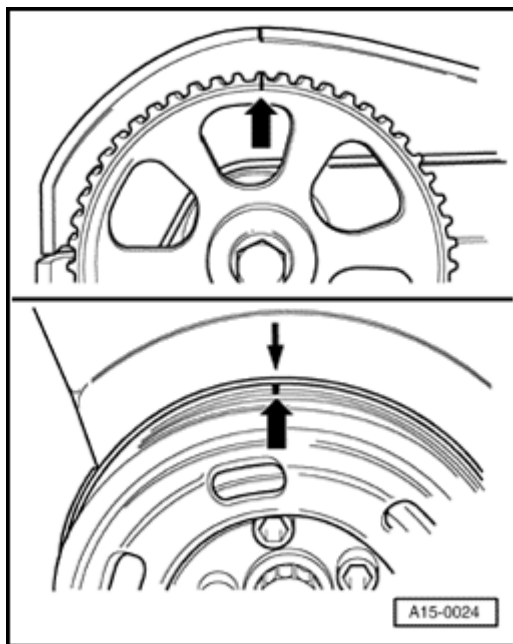
- Remove holder for chain tensioner 3366.



- Slightly coat shaded area of dual bearing cap with sealant AMV 188 001 02 and install bearing cap (observe position dowel sleeves).
- Install remaining bearing caps (watch position of dowel sleeves).
- Replace sealing rings for intake and exhaust camshafts ⇒ as of ⇒ [Page 15-50](#) .



- Install camshaft sprocket.
 - ◆ Note correct installation position: Narrow web of camshaft sprocket faces outward -arrows- and marking for No. 1 is visible from front.
- Install securing bolt for camshaft sprocket (use counter hold tool 3036).
- Install camshaft position sensor ⇒ [Page 15-46](#) .
- Install cylinder head cover ⇒ [Page 15-18](#) .



- Align markings on camshaft sprocket with marking on cylinder head cover.
- Align marking on vibration damper with marking on lower part of toothed belt guard.

Note:

When turning the camshaft the crankshaft must not be at TDC. There is a danger of damage to the valves/piston crown.

- Install toothed belt (adjust valve timing) ⇒ [Page 13-44](#) .

Note:

- ◆ *Observe all instructions on removing and installing the toothed belt ⇒ [Page 13-40](#) .*
- ◆ *Wait about 30 minutes after installing the camshafts before starting the engine. Hydraulic valve compensation elements have to settle (otherwise valves will strike pistons).*
- ◆ *After working on the valve gear, turn the engine carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated.*

15-73

Tightening torques

Component	Nm
Bearing cap to cylinder head	10
Camshaft adjuster to cylinder head	10
Camshaft position sensor rotor to camshaft	25
Camshaft position sensor housing to cylinder head	10
Camshaft sprocket to camshaft	65

Hydraulic valve lifters, checking

Special tools and equipment

- ◆ Feeler gauge
- ◆ Wood or plastic wedge

Note:

- ◆ *Hydraulic valve lifters cannot be adjusted or repaired.*
- ◆ *Irregular valve noise during starting is normal.*

Test sequence

- Start engine and let run until coolant temperature has reached approx. 80 ° C.
- Increase engine speed to about 2500 rpm for 2 minutes (perform road test if necessary).

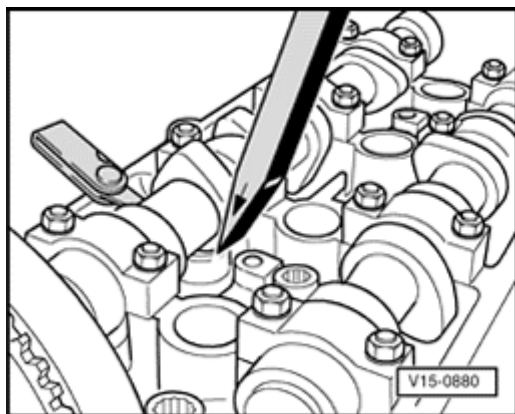
Note:

If the irregular valve noises stop but recur repeatedly during short journeys, a new oil retention valve must be fitted. Oil retention valve location: In oil filter bracket ⇒ -Item 6 -, ⇒ [Page](#)

[17-7](#) .

If the hydraulic lifters are still noisy, locate faulty lifters as follows:

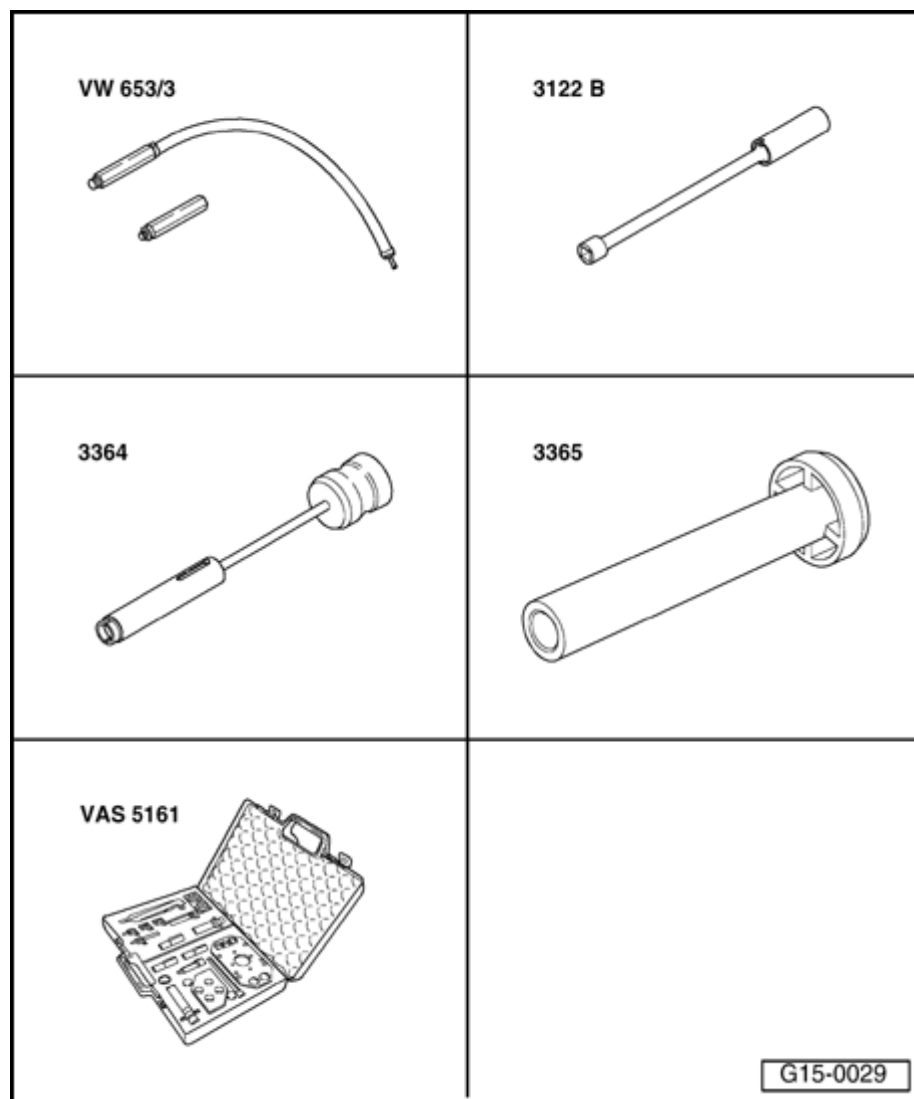
- Remove cylinder head cover ⇒ [Page 15-15](#) .
- Rotate crankshaft until cams of lifters to be checked are pointing upward:
- Vehicles with manual gearbox: push vehicle forward with 4th gear engaged and ignition switched off.
- Vehicles with automatic gearbox: remove sound insulation and turn crankshaft clockwise by applying wrench to central bolt on crankshaft sprocket.
- Determine play between cam and lifter.
- Press down lifter with a wooden or plastic wedge. If an 0.20 mm feeler gauge can be inserted between camshaft and lifter, replace lifter.
- Replacing lifter ⇒ Removing and installing camshafts and camshaft adjuster, ⇒ [Page 15-62](#) .



Note:

- ◆ *Wait about 30 minutes after installing the camshafts before starting the engine. Hydraulic valve compensation elements have to settle (otherwise valves will strike pistons).*
- ◆ *After working on the valve gear, turn the engine carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated.*

15-77



Valve stem seals, replacing

Special tools and equipment

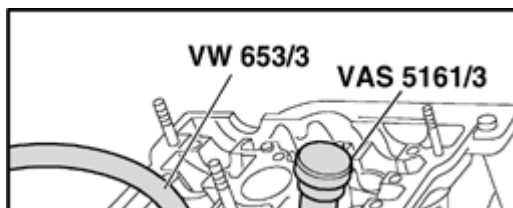
- ◆ Pressure hose VW 653/3
- ◆ Spark plug spanner 3122 B
- ◆ Puller 3364
- ◆ Installation tool 3365
- ◆ Disassembly and assembly tool VAS 5161

Removing

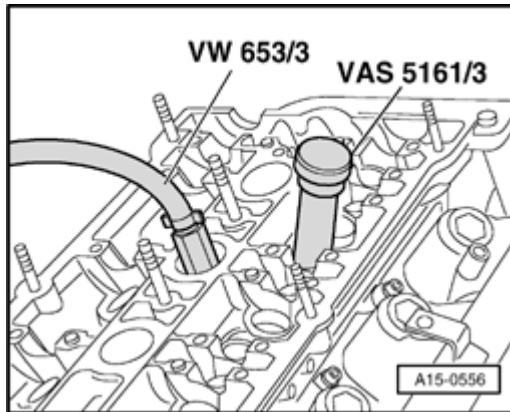
- Cylinder head in vehicle.
- Remove camshafts and camshaft adjuster ⇒ [Page 15-62](#) .

Note:

- ◆ *Ensure that the valve lifters are not interchanged.*
- ◆ *Mark position of valve lifters on rear of lifter with a waterproof felt-tip pen.*
- Remove lifters from guides and put them down with contact surface downward.
- Remove spark plugs with spark plug spanner 3122B.
- Set piston of appropriate cylinder to bottom dead center.
- 4 - Thread pressure hose VW 653/3 into spark plug threaded hole and apply constant pressure of at least 6 bar.



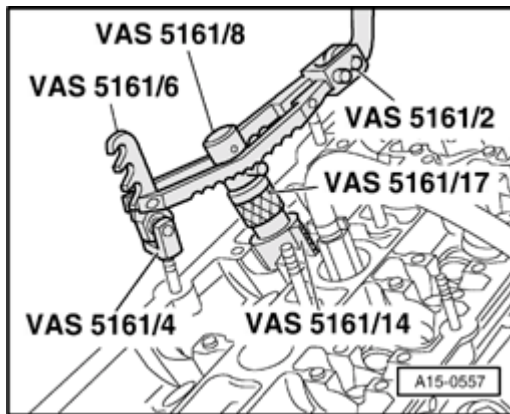
15-79



A

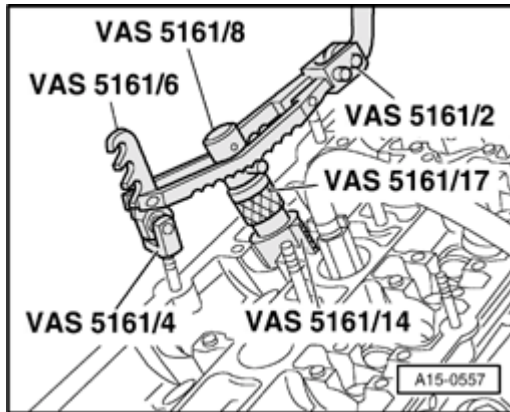
- Install knock journal VAS 5161/3 into valve lifter guide.
- Loosen solid valve keepers on all five valves with a plastic hammer.

Exhaust side



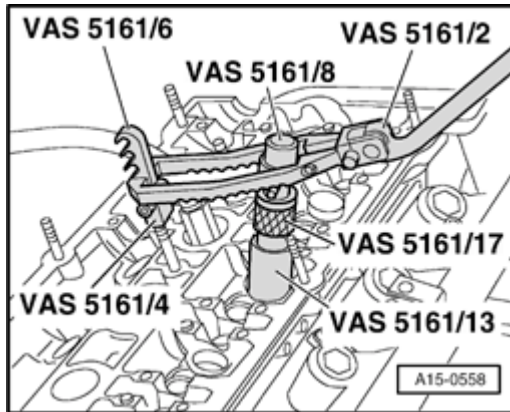
A

- Thread catch part VAS 5161/6 with insertion fork VAS 5161/4 onto a stud of cylinder head.
- Push guide bushing VAS 5161/14 as far as it will go into lifter guide at valve to be removed.
 - ◆ Installation position: Shaded areas point across to driving direction.
- Push knurled distance ring VAS 5161/17 onto assembly cartridge VAS 5161/8.



A

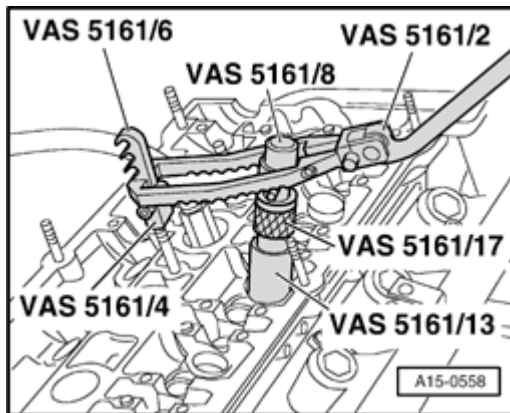
- Push assembly cartridge into guide sleeve.
- Attach pressure fork VAS 5161/2 to catch part VAS 5161/6 and press assembly cartridge downward.
- At same time turn knurled screw of assembly cartridge toward right until tips engage in valve keepers.
- Slightly move knurled screw back and forth. This causes valve keepers to be pressed apart and taken into cartridge.
- Release pressure fork.
- Remove assembly cartridge with spacer ring, guide bushing, valve plate and valve spring.

**Intake side:**

A

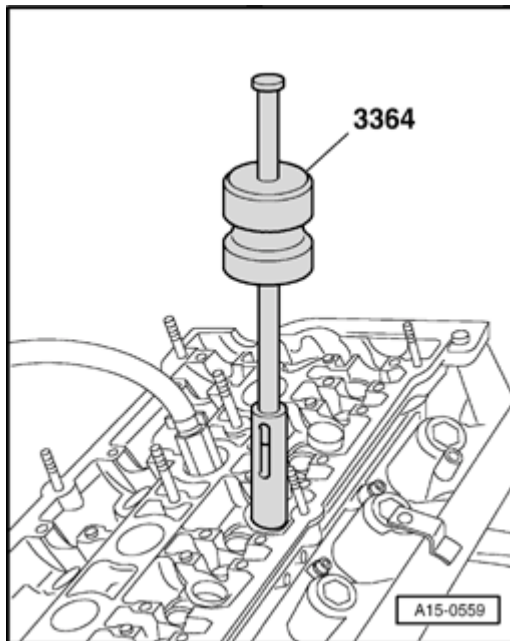
- Thread catch part VAS 5161/6 with insertion fork VAS 5161/4 onto a stud of cylinder head.
- Push in guide bush VAS 5161/13 as far as it will go into lifter guide at valve to be removed.
 - ◆ Installation position: Shaded areas point across to driving direction.
- Push distance ring VAS 5161/17 onto assembly cartridge VAS 5161/8.
- Push assembly cartridge into guide sleeve.
- Attach pressure fork VAS 5161/2 to catch part VAS 5161/6 and press assembly cartridge downward.
- At same time turn knurled screw of assembly cartridge towards right until the tips engage in valve keepers.
- Slightly move knurled screw back and forth. This causes valve keepers to be pressed apart and taken into cartridge.

15-82



A

- Release pressure fork.
- Remove cartridge with spacer ring, guide bushing, valve plate and valve spring.

All models:

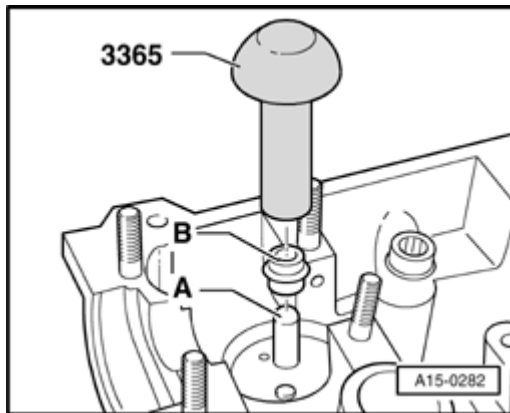
A

- Use 3364 to pull off valve stem seals.

Installing

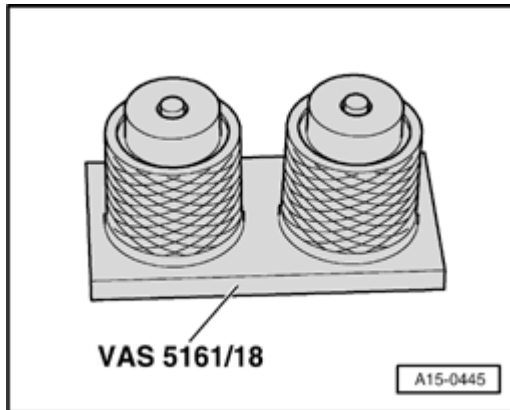
Note:

A plastic sleeve -A- is enclosed with new valve shaft seals.



A

- To prevent damage to new valve stem seals -B-, place plastic sleeve -A- on valve stem.
- Lightly oil sealing lip of valve stem seal.
- Push valve stem seal onto plastic sleeve.
- Carefully press valve stem seal onto valve guide using presser tool 3365.
- Remove plastic sleeve again.



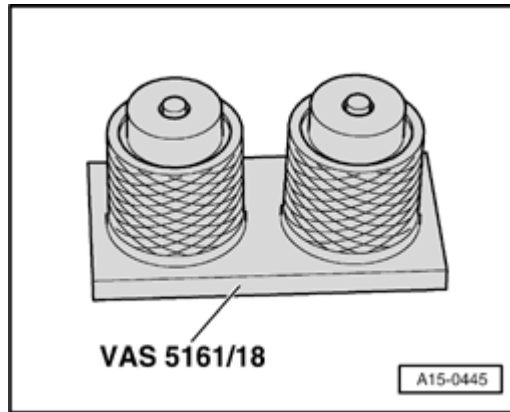
A

- If valve keepers were taken out of assembly cartridge they must first be inserted into tool VAS 5161/18.

Note:

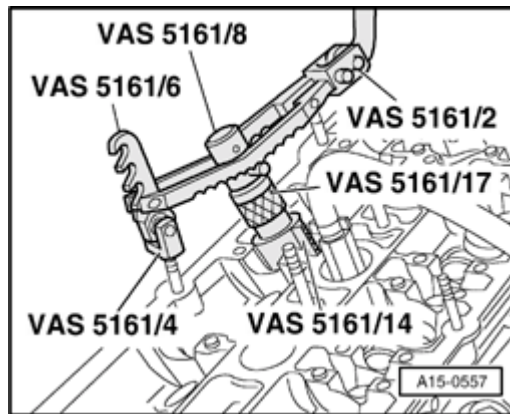
The large diameter of the valve keepers points upward.

15-84



A

- Press assembly cartridge VAS 5161/8 onto insert tool from top and take up valve keepers.



A

- Insert assembly cartridge VAS 5161/8 into guide bushing VAS 5161/13 or VAS 5161/14 again.
- Push pressure fork down and pull knurled screw with left-hand and right-hand thread upward. The valve keepers are now installed.
- Take load off pressure fork when knurled screw is still pulled.
- Install valve lifters.

- Install camshafts and camshaft adjuster ⇒ [Page 15-67](#)

Note:

- ◆ *Wait about 30 minutes after installing the camshafts before starting the engine. Hydraulic valve compensation elements have to settle (otherwise valves will strike pistons).*
- ◆ *After working on the valve gear, turn the engine carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated.*

Valve guides, checking

Special tools and equipment



- ◆ Universal dial indicator bracket VW 387
- ◆ Dial indicator

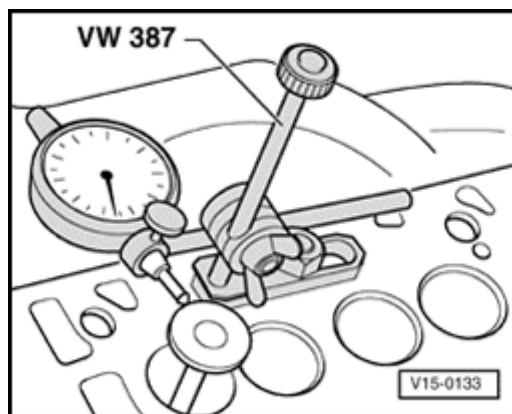
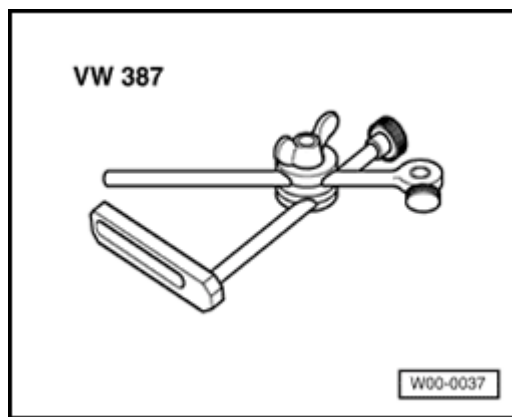
Test sequence



- Set valve in guide. Valve stem end must be flush with guide.

Note:

Due to the slight difference in stem diameters, ensure that only an intake valve is used in an intake guide and an exhaust valve in an exhaust guide.



- Determine lateral play.

Wear limit

Intake valve guide	Exhaust valve guide
0.80 mm	0.80 mm

Note:

- ◆ *If the wear limit is exceeded, repeat the measurement with new valves. Replace valve guide if wear limit is still exceeded.*
- ◆ *If the valve is to be replaced as part of a repair, use a new valve for the calculation.*

Valve seats, reworking

Note:

If a good seating pattern cannot be obtained by grinding the valve seats (lapping), they must be refaced (reworked):

Special tools and equipment

- ◆ Depth gauge
- ◆ Valve seat machining tool

Note:

- ◆ *When repairing engines with leaking valves, it is not sufficient to reface the valve seats and replace the valves. The valve guides must also be checked for wear. This is particularly important on high mileage engines ⇒ [Page 15-86](#).*
- ◆ *Only rework the valve seats as far as is necessary to ensure a good seating pattern.*
- ◆ *Before starting to rework the valve seats, calculate the maximum permissible reworking dimension.*

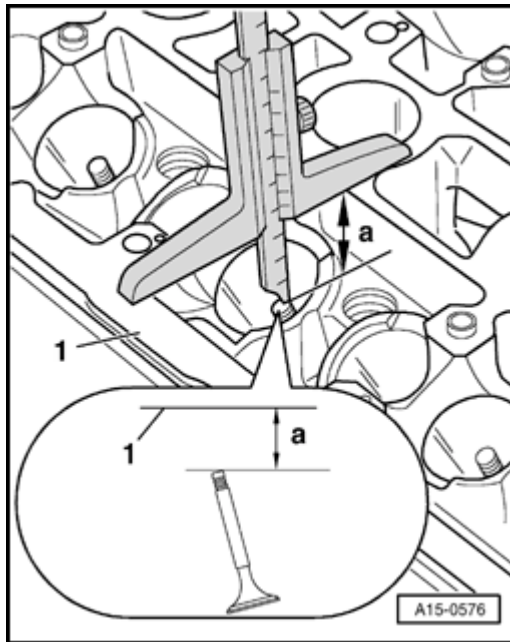
- ◆ *If the maximum reworking dimension is exceeded, the hydraulic lifters will not work properly and the cylinder head will have to be replaced.*

Calculating maximum permissible reworking dimension

- Insert valve and press firmly against valve seat.

Note:

If the valve is to be replaced as part of a repair, use a new valve for the calculation.



A

- Measure distance -a- between valve stem end (upper edge) and upper cylinder head surface -1- with a depth gauge.
- Calculate max. permissible reworking dimension from measured distance and minimum dimension.

Minimum dimensions		
Outer intake valves	Central intake valve	Exhaust valves
31.0 mm	32.2 mm	31.9 mm

Measured distance minus minimum dimension =
max. permissible reworking dimension.

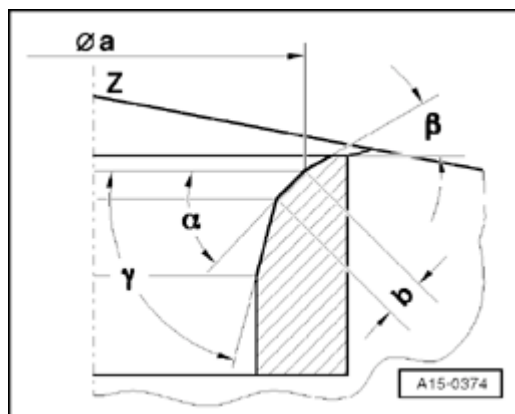
Example (for outer intake valve):

	Measured distance	31.4 mm
-	Minimum dimension	-31.0 mm
=	max. permissible reworking dim.	= 0.4 mm

Note:

If the maximum permissible reworking dimension is 0 mm or less than 0 mm, repeat the measurement with a new valve. If the measured result is again 0 mm or less than 0 mm, replace the cylinder head.

15-91



Rework valve seats

Dim.		Intake valve seat
Dia. a	mm	26.2
b	mm	1.5 to 1.8
Z		Lower edge of cylinder head
α	45°	Valve seat angle
β	30°	Upper correction angle
γ	60°	Lower correction angle
Dim.		Exhaust valve seat
Dia. a	mm	29.0
b	mm	1.8
Z		Lower edge of cylinder head
α	45°	Valve seat angle
β	30°	Upper correction angle
γ	60°	Lower correction angle

15-92

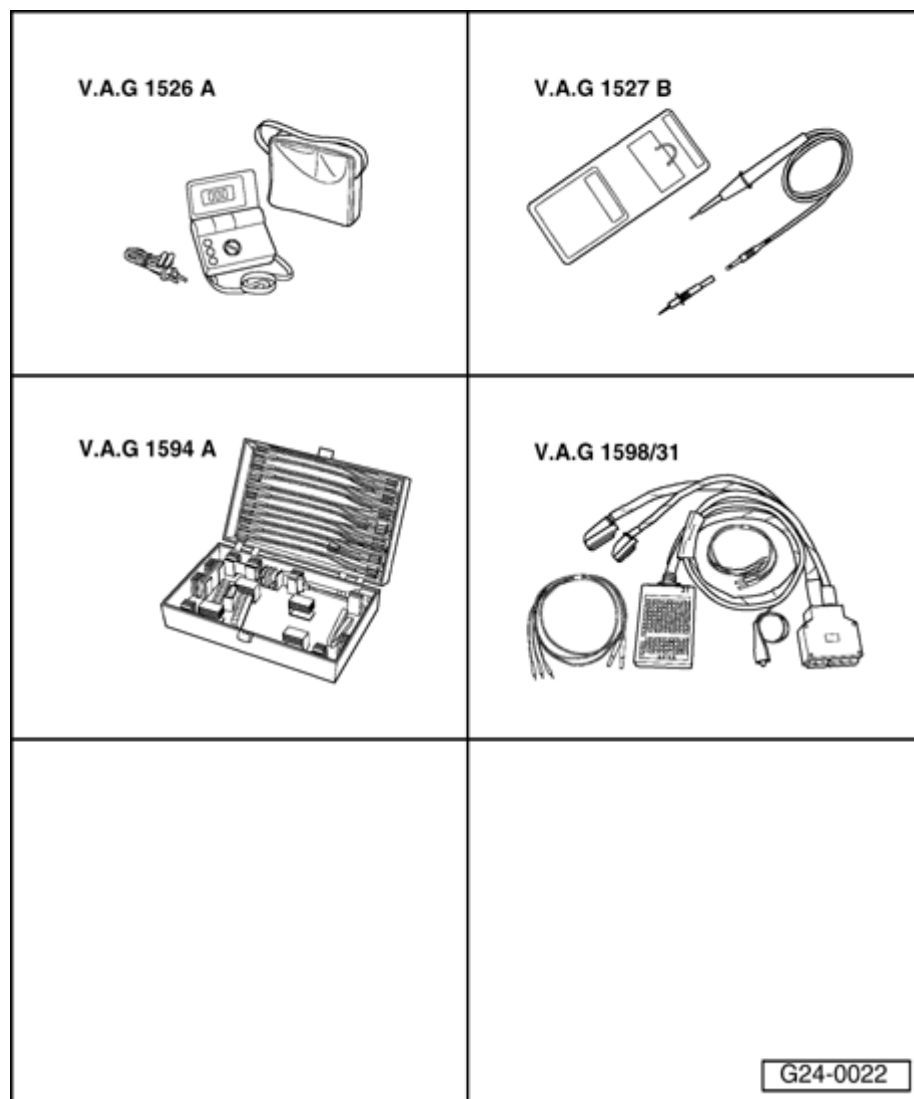
Camshaft timing control, checking

The adjustment of the intake camshaft is dependent on the engine load and engine speed. Oil pressure is applied to the camshaft adjuster (mechanical adjustment device) via the electrical solenoid valve for camshaft adjustment.

Note:

Camshaft timing control only becomes active 25 seconds after starting engine.

15-93



Camshaft adjustment solenoid valves, checking

Special tools and equipment

- ◆ VAG 1526 A
- ◆ VAG 1527 B
- ◆ VAG 1594 A
- ◆ VAG 1598/31

15-94

Test requirements:

- Vehicle diagnostic, testing and information system VAS 5051 or VAG 1551 Scan Tool connected

Test sequence

- Initiate output Diagnostic Test Mode (DTM) and activate solenoid valve for camshaft adjuster.

**Display**

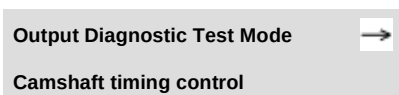
- ◆ This valve is actuated (clicks) for approx. one minute if the operation is not switched to the next component by pressing the → key.

If the valve is not actuated (does not click).

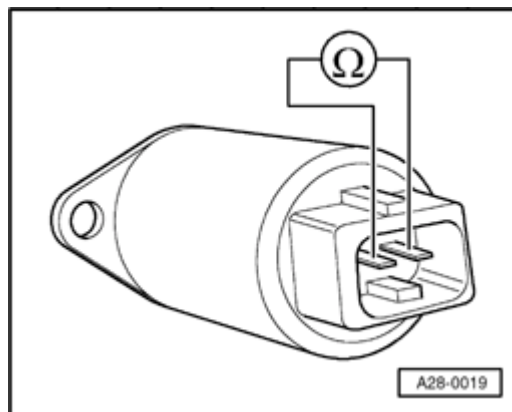
- Check internal resistance of solenoid valve for camshaft adjuster.

Checking internal resistance

- Switch ignition off.
- ◆ - Disconnect connector -arrow- from camshaft adjuster.



15-95



A

- Connect multimeter to valve to measure resistance.
- Specified value: 10 to 18 Ω

If specified value is not attained:

- Replace solenoid valve for camshaft adjuster.

If specified value is attained:

- Check power supply.

Checking power supply

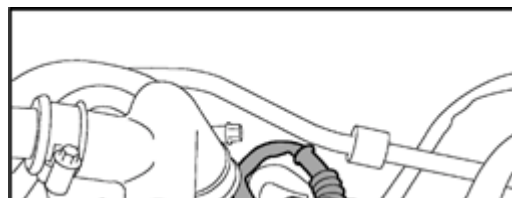
Test requirements:

- Fuse for solenoid valve for camshaft adjustment OK

⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder*

- Fuel pump relay OK.

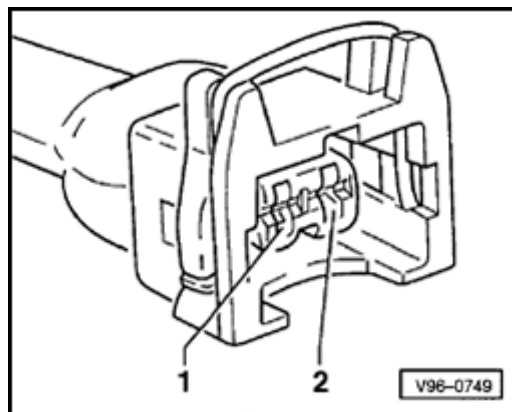
⇒ [*Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Engine Code\(s\): AWM, Repair Group 24*](#)



A

- Disconnect connector -arrow- from camshaft adjuster.

15-96



A

- Connect voltage tester VAG 1527 B as follows:

Connector contact	Measure to
1	Engine Ground

- Operate starter briefly.
 - LED should light up.

If the LED does not light up:

- Check wiring from contact 1 on connector via fuse to fuel pump relay for open circuit:

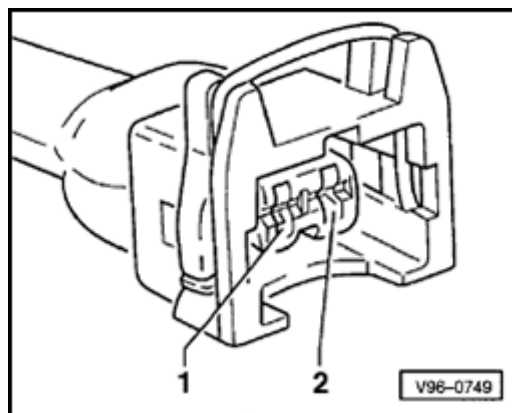
⇒ *Electrical Wiring Diagrams, Troubleshooting & Component Locations binder*

- Correct open circuit, if necessary.

If the LED lights up:

- Check actuation.

15-97



Output Diagnostic Test Mode →
Camshaft timing control

Checking actuation



- Connect voltage tester VAG 1527 B to contacts 1 (positive) and 2 of connector.
- Initiate output Diagnostic Test Mode (DTM) and activate solenoid valve for camshaft adjuster.



Display

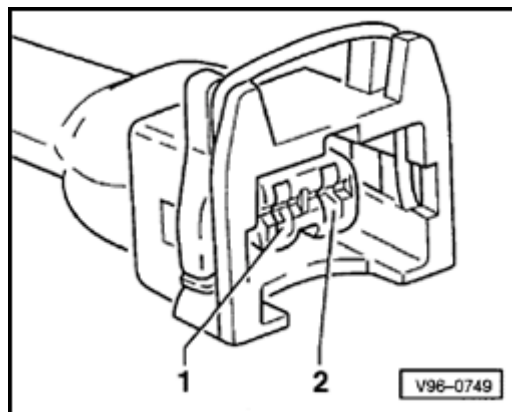
- ◆ LED should flash.

If the LED lamp does not flash or if it lights up continuously:

- Connect the VAG 1598/31 test box to wiring harness leading to engine control module (the engine control module should not be connected):

⇒ [Repair Manual, 1.8 Liter 4-Cyl. 5V Turbo Fuel Injection & Ignition, Engine Code\(s\): AWM, Repair Group 24](#)

15-98



A

- Check for open circuit and short to positive or Ground in following wiring connection:

Connector	Test box VAG 1598/31
Contact	
2	115

- If necessary, correct short circuit to Ground or open circuit.

If the wiring is OK:

- Replace engine control module.

If no fault is found:

- Replace mechanical camshaft adjuster.

Lubrication system components, removing and installing

Note:

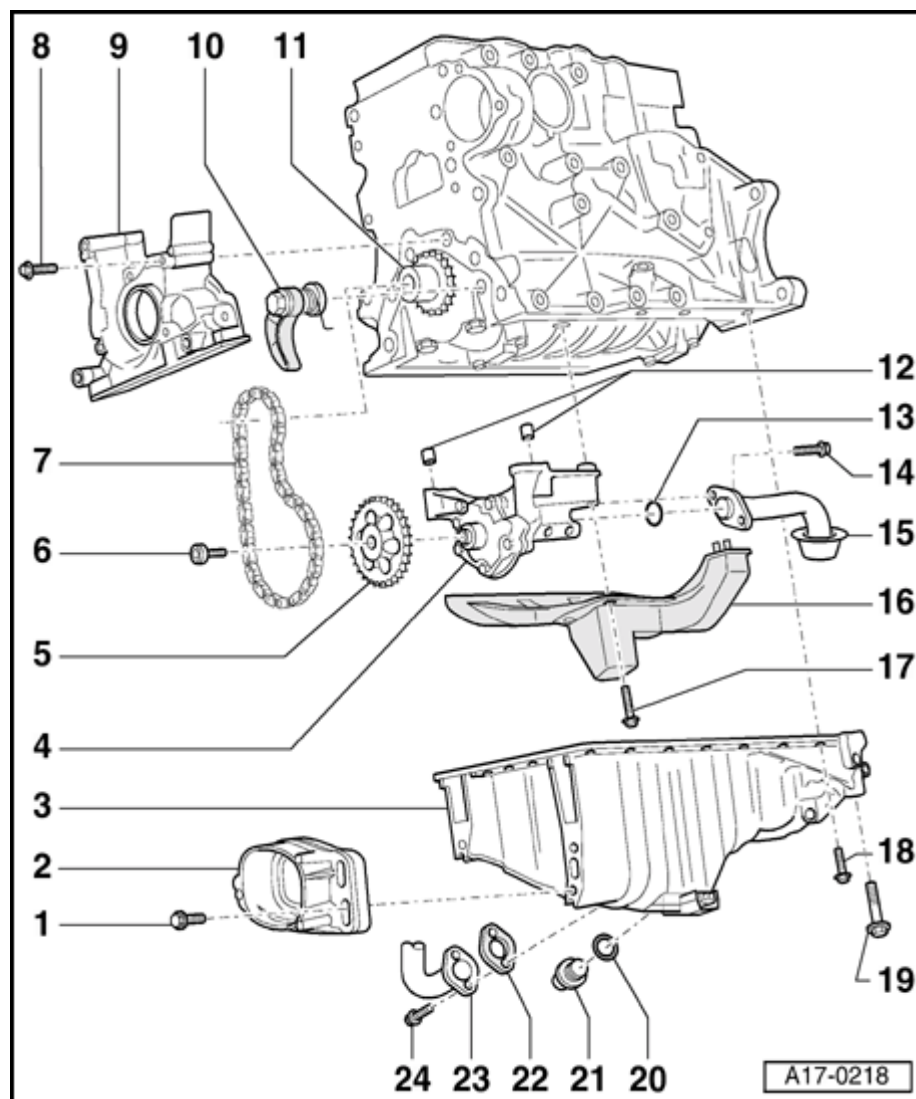
- ◆ *If large quantities of metal shavings or particles are found in the engine oil when repairing the engine, all oil passages must be cleaned carefully, and the oil cooler replaced in order to prevent further damage occurring later.*
- ◆ *The oil level must not be above max. mark on dipstick - danger of damage to catalytic converter!*
- ◆ *Oil spray jet and pressure relief valve ⇒ Fig. ⇒ [1](#) , ⇒ [Page 17-6](#)*

Viscosity grades and oil specifications:

⇒ [Repair Manual, Maintenance](#)

Oil system capacity:

⇒ [Repair Manual, Maintenance](#)



Part I - Oil pump/oil pan components

1 - 28 Nm

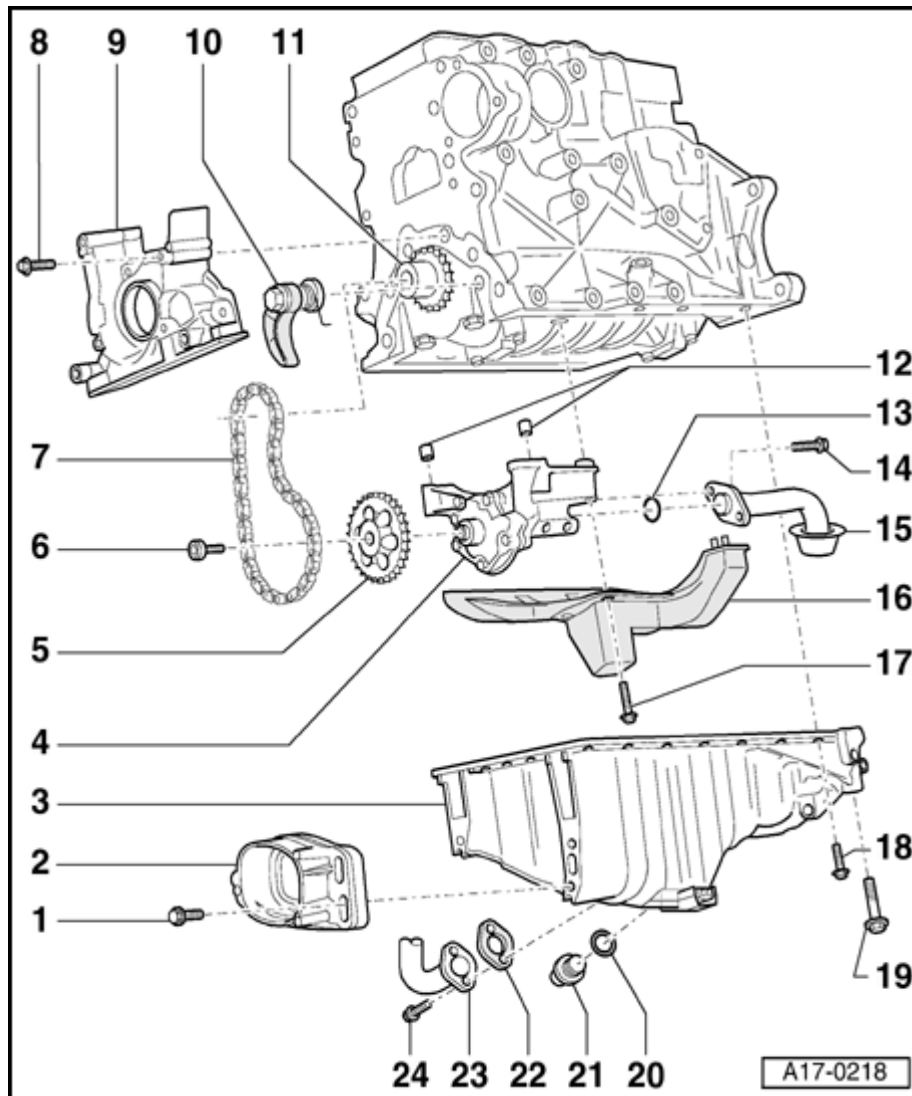
2 - Limit stop for torque reaction support

3 - Oil pan

- ◆ Apply silicone sealant D 176 404 A2 before installing
- ◆ Removing and installing ⇒ [Page 17-11](#)

4 - Oil pan

- ◆ With pressure relief valve (12 bar)
- ◆ Removing and installing ⇒ [Page 17-28](#)
- ◆ Before installation check whether the two dowel sleeves -Pos. 12 - for the centralizing of the oil pump/cylinder block are present
- ◆ Replace pump if there is scoring on moving surfaces and gear teeth
- ◆ Tightening torque for oil pump cover to oil pump housing: 10 Nm



5 - Chain sprocket for oil pump

- ◆ Sprocket can only be installed on oil pump shaft in one position

6 - 22 Nm

7 - Drive chain for oil pump

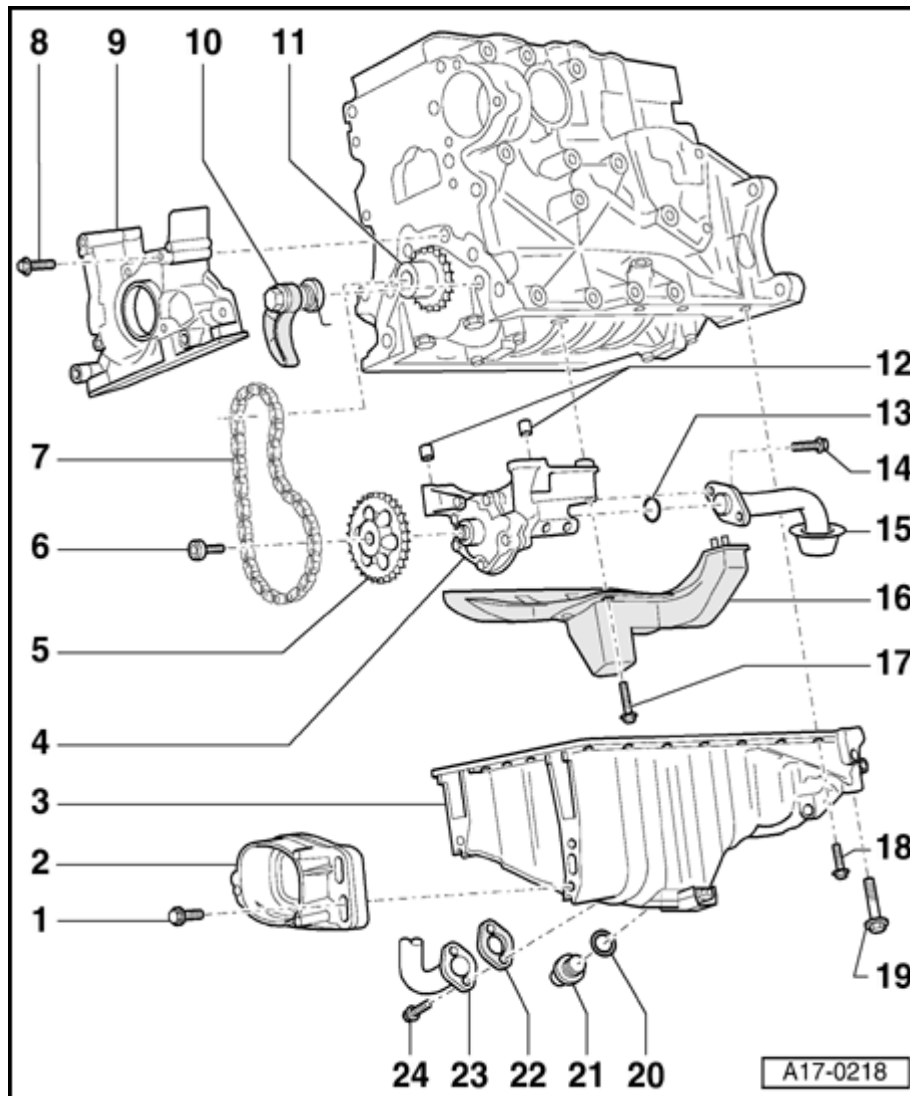
- ◆ Mark direction of rotation before removing
- ◆ Check for wear

8 - 15 Nm

9 - Sealing flange - front

- ◆ Apply silicone sealant D 176 404 A2 ⇒ [Page 13-56](#)
- ◆ Replacing crankshaft oil seal on pulley end ⇒ [Page 13-51](#)

17-4

**10 - Chain tensioner**

- ◆ Tighten to 16 Nm
- ◆ Do not disassemble
- ◆ Note installation position
- ◆ Pre tension spring and engage before installing
- ◆ If spring is broken replace chain tensioner complete

11 - Chain sprocket for oil pump

- ◆ Removing and installing ⇒ [Page 13-77](#)

12 - Dowel sleeves

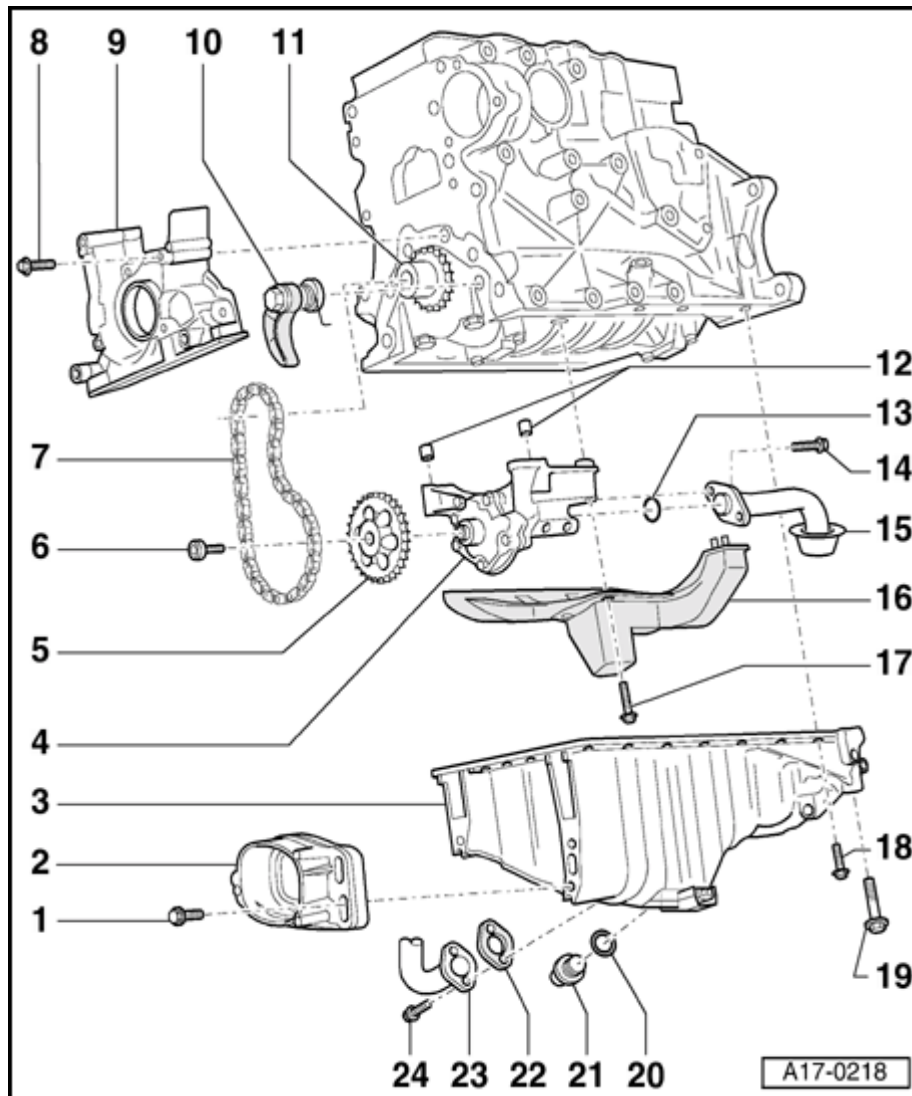
- ◆ 2 pieces

13 - O-ring

- ◆ Always replace

14 - 16 Nm**15 - Suction pipe**

- ◆ Clean strainer if soiled



16 - Baffle plate

17 - 16 Nm

18 - 15 Nm

◆ Tighten in stages and in diagonal sequence

◆ Observe tightening sequence ⇒ [Page 17-25](#)

19 - 40 Nm

20 - Sealing ring

◆ Always replace

21 - Oil drain plug, 30 Nm

22 - Gasket

◆ Always replace

23 - 10 Nm

24 - Oil return pipe

◆ From exhaust turbocharger

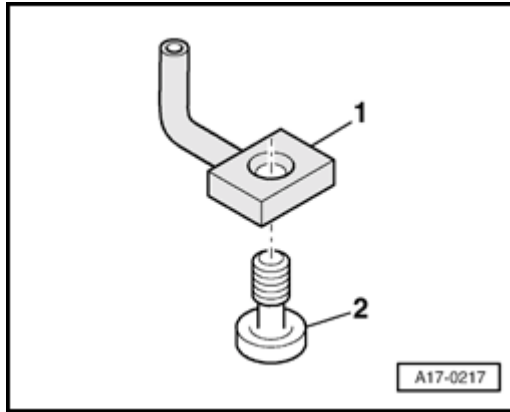
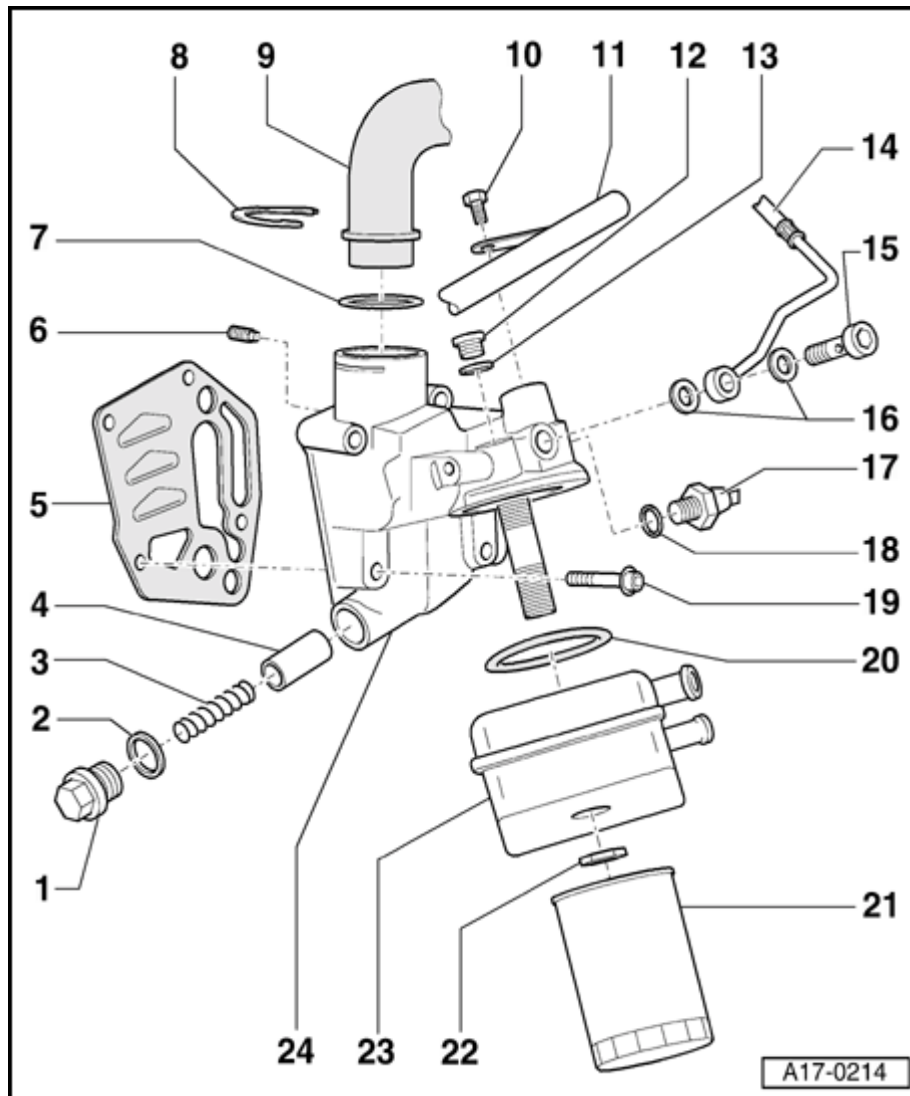


Fig. 1 Oil spray jet and pressure relief valve

1 - Oil spray jet (for piston cooling)

2 - Bolt with pressure relief valve - 27 Nm

◆ Opening pressure 1.3 to 1.6 bar



Part II - Oil filter bracket components

1 - Screw plug - 40 Nm

2 - Sealing ring

◆ Always replace

3 - Spring

◆ For pressure relief valve, approx. 4 bar

4 - Piston

◆ For pressure relief valve, approx. 4 bar

5 - Gasket

◆ Always replace

6 - Oil retention valve

◆ Tighten to 8 Nm

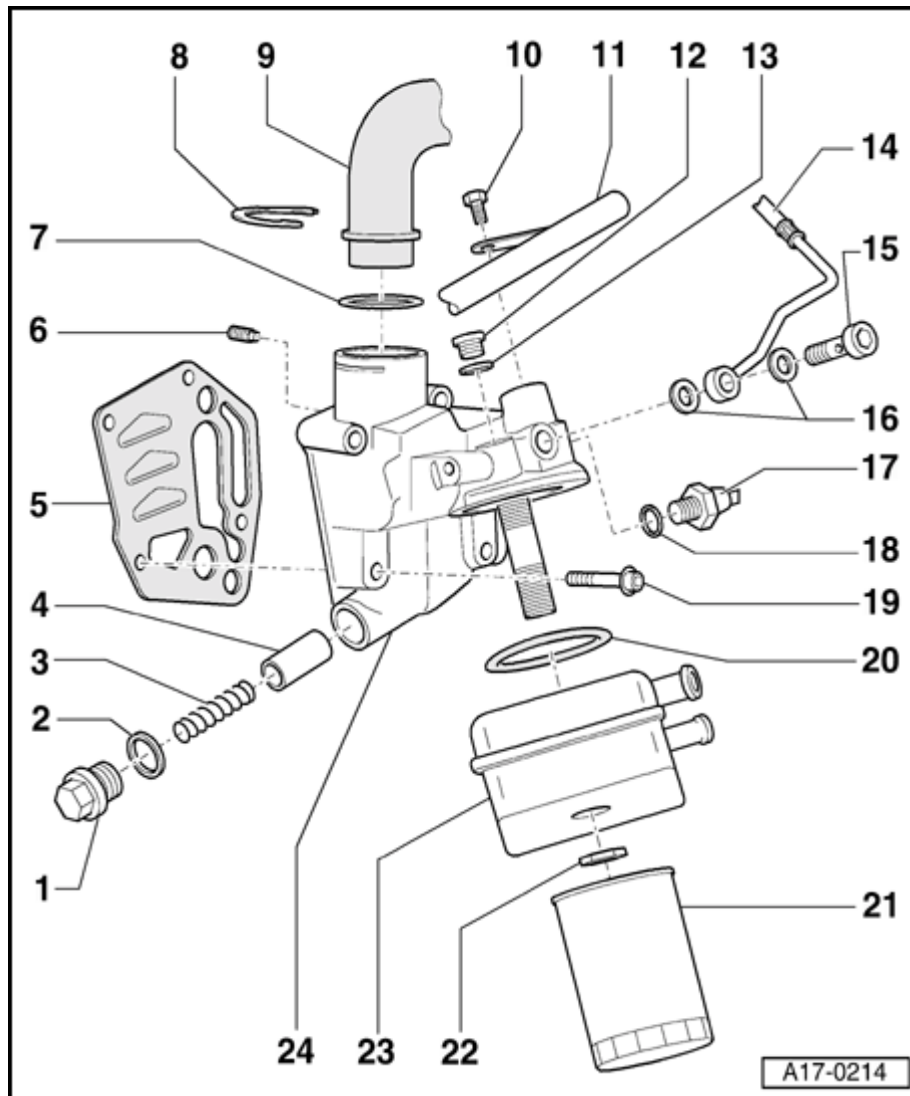
◆ Built into oil filter bracket

7 - O-ring

◆ Always replace

◆ Slide on until flush with collar on pipe -Item 9 -

17-8

**8 - Locking clip****9 - Pipe**

◆ For crankcase breather

10 - 20 Nm

◆ Install with locking fluid D 000 600 A2

11 - Bottom coolant pipe**12 - Screw plug - 15 Nm****13 - Sealing ring**

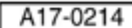
◆ If seal is leaking, cut open and replace

14 - Oil supply pipe

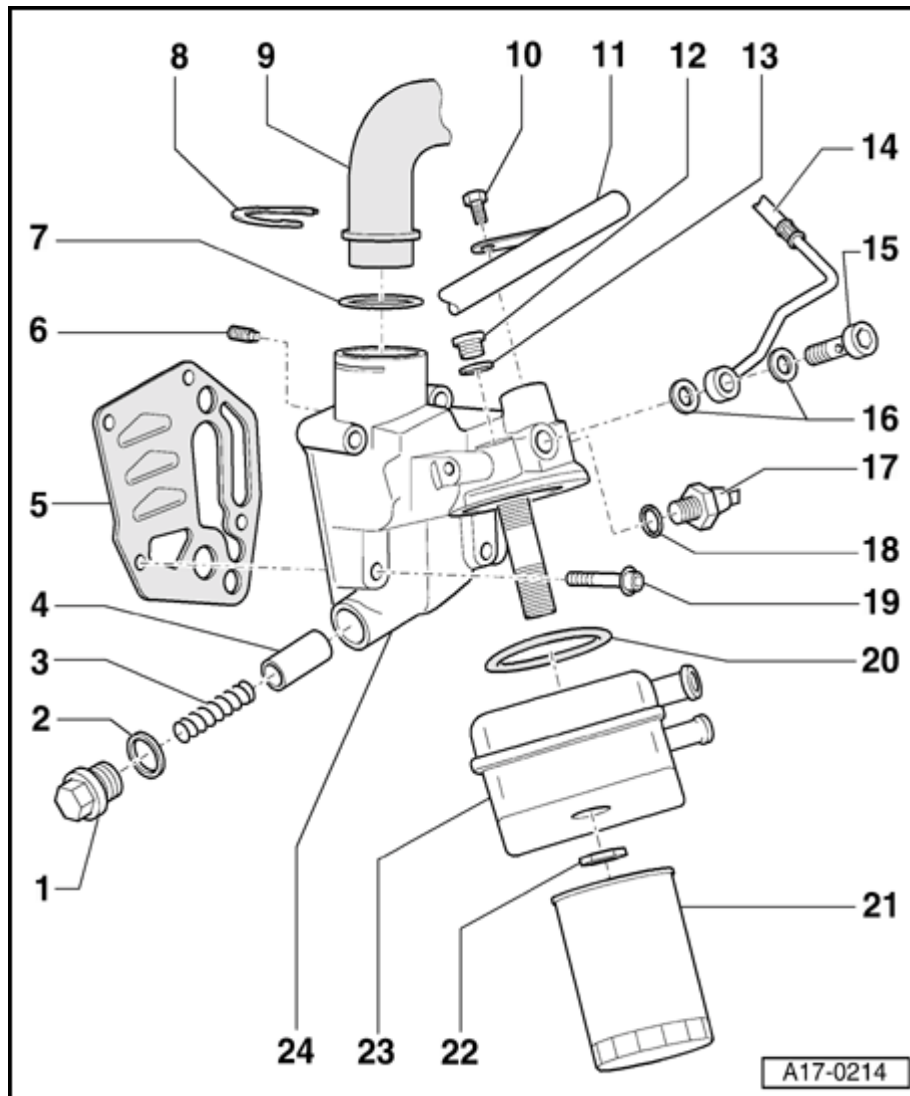
◆ To turbocharger

15 - Banjo bolt - 30 Nm**16 - Seals**

◆ Always replace



◆ Tighten to 20 Nm



22 - 25 Nm

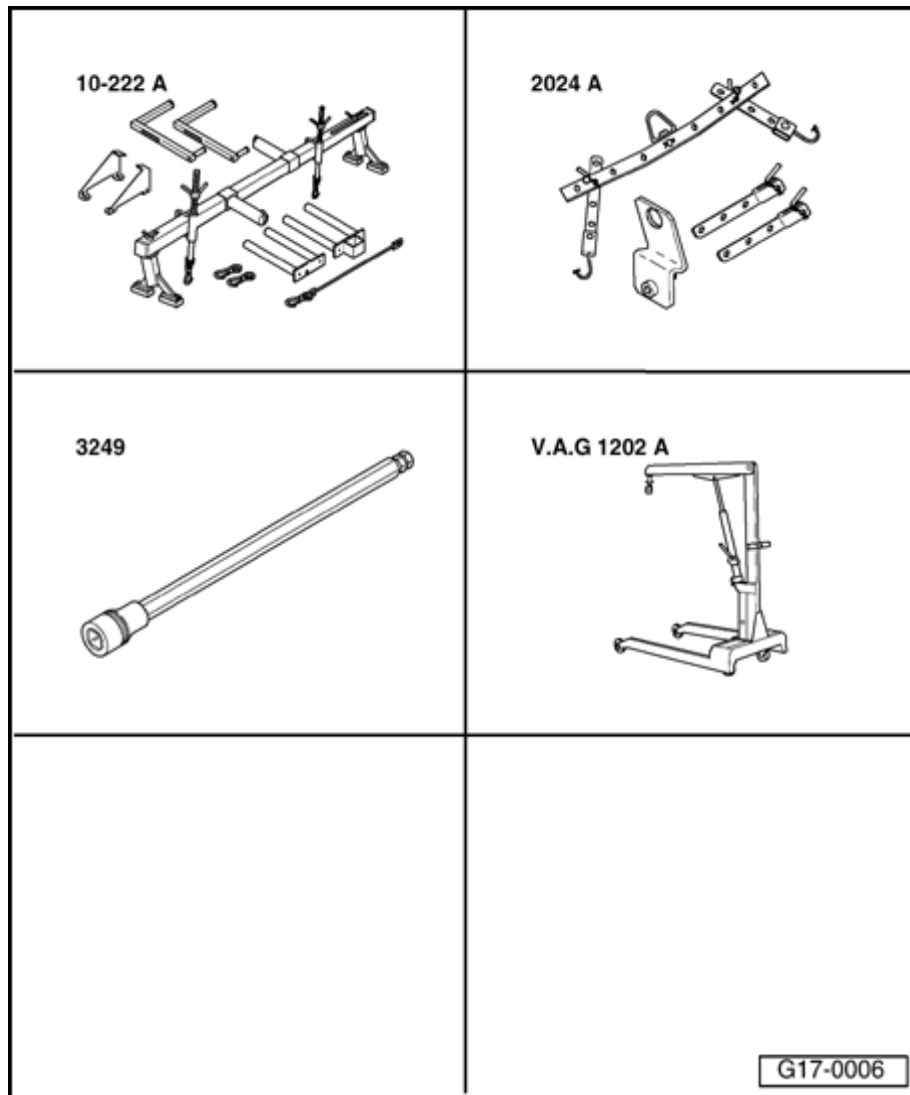
23 - Oil cooler

- ◆ See note ⇒ [Page 17-1](#)
- ◆ Ensure clearance to adjacent components
- ◆ Coolant hose connection diagram ⇒ [Page 19-2](#)

24 - Oil filter bracket

- ◆ With pressure relief valve, approx. 4 bar

17-11



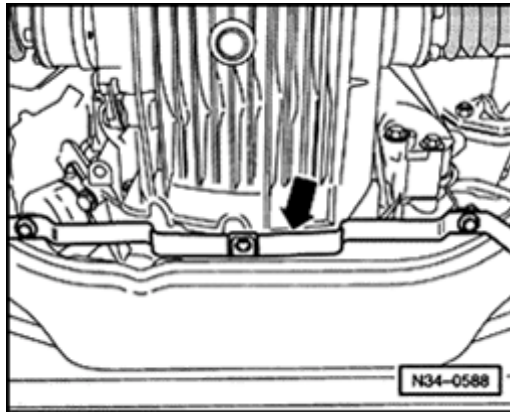
Oil pan, removing and installing

Special tools and equipment

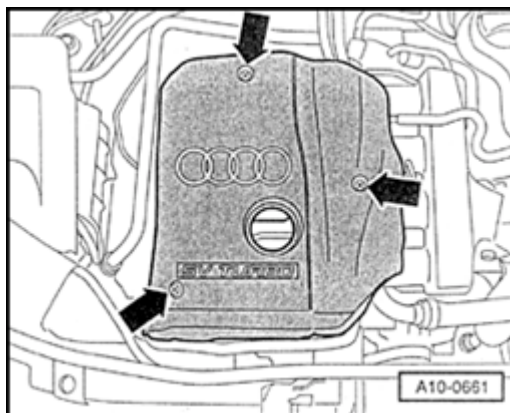
- ◆ Support bar 10-222A
- ◆ Lifting tackle 2024 A
- ◆ Socket 3249
- ◆ Workshop crane VAG 1202 A
- ◆ Electric drill with plastic brush attachment
- ◆ Protective goggles

Removing

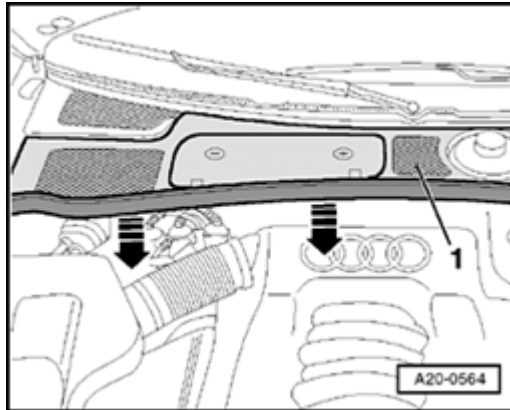
- Engine in vehicle
- Lock carrier must be in service position ⇒ [Page 13-1](#) .



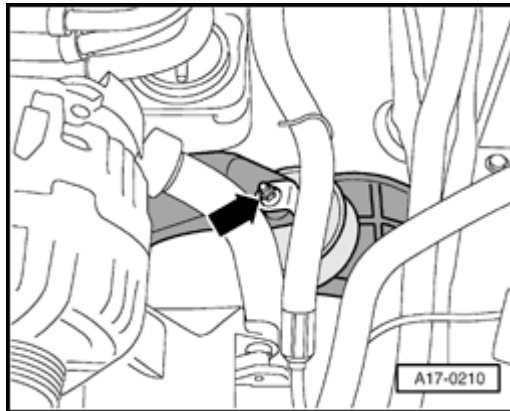
- Unbolt bracket for sound insulation -arrow-.
- Remove air duct hose on bottom left on charge air cooler.



- Remove engine cover -arrows-.

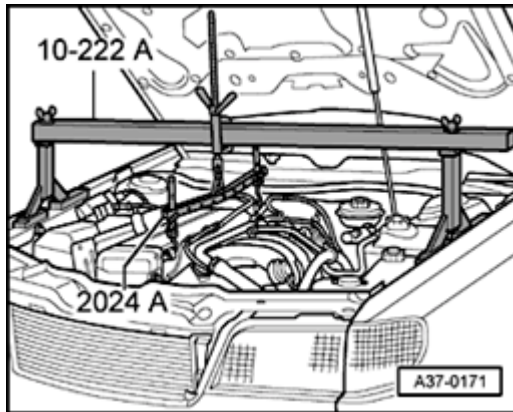
17-13**A**

- Remove seal from plenum chamber cover in direction of arrow.
- Remove plenum chamber cover -1- from front.

**A**

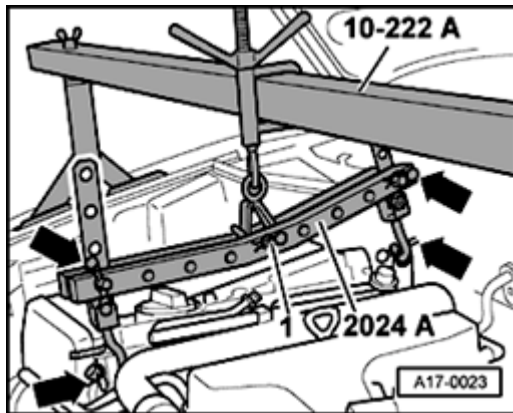
- Remove nut -arrow- from top of left engine mounting.

17-14



A

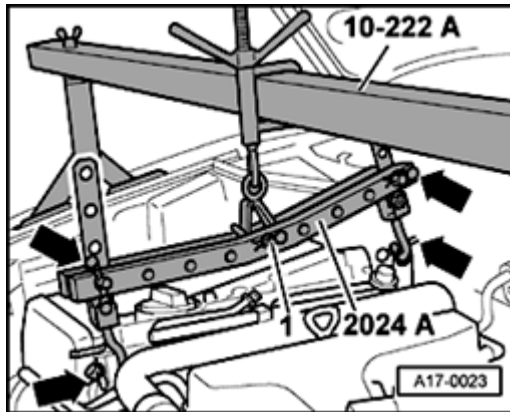
- Set up support bar 10-222 A on fender panel flanges.



A

- Remove lifting eye from lifting tackle 2024 A.
- Replace pin -1- in center hole on lifting tackle and secure with locking pin.
- Engage pin on lifting tackle 2024 A on spindle of support bar 10-222 A.

17-15



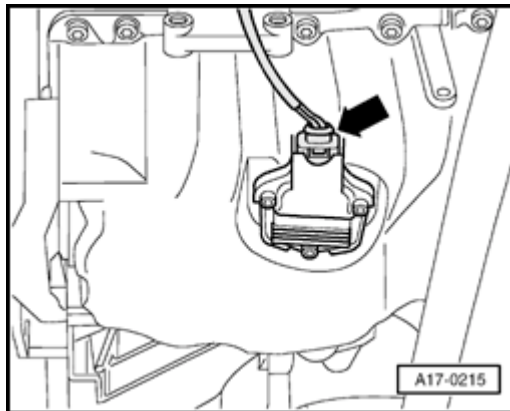
A

- Engage lifting tackle 2024 A in front and rear lifting eyes on engine.

CAUTION!

The hooks and locating pins of the lifting tackle must be secured with locking pins -arrows in illustration-.

- Pretension engine with spindle of support bar, do not lift.
- Drain engine oil.
- Remove oil return line of exhaust turbocharger from oil pan.



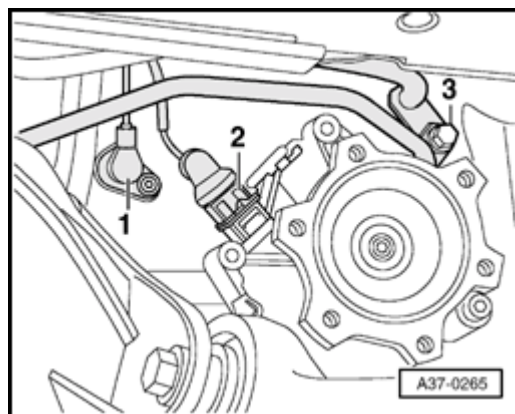
A

- Disconnect electrical connector -arrow- from oil level sender.

Vehicles with automatic transmission:**Note:**

Observe cleanliness rules when working on the automatic transmission:

⇒ [Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37](#)



- Remove bolt -3- and disconnect ATF lines from transmission.

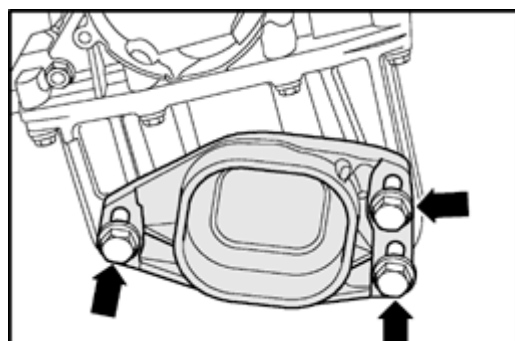
Note:

Ignore positions -1- and -2-.

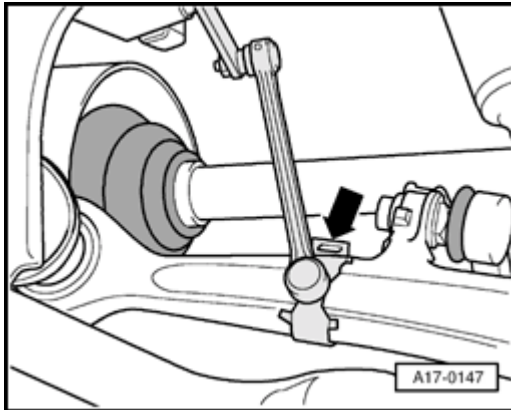
- Remove bracket for ATF lines from engine.
- Move ATF lines aside.

All models:

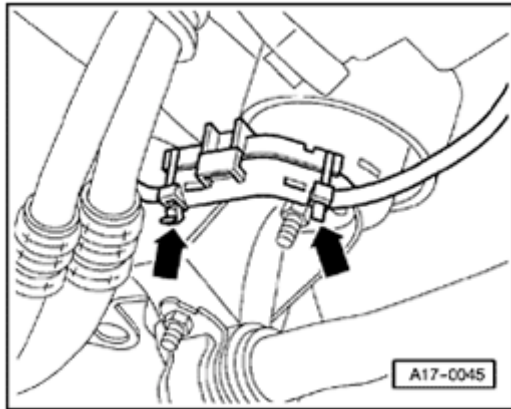
- Remove stop for torque reaction support -arrows-.



17-17

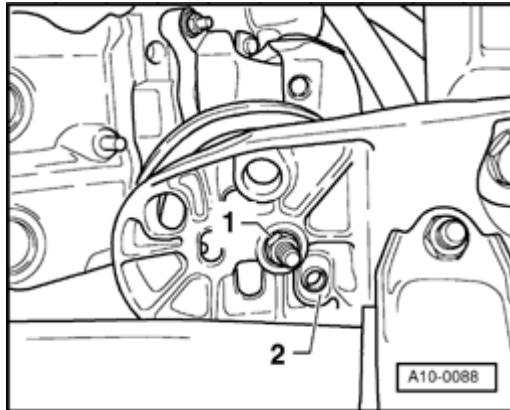


- A
- Where present unclip operating rod of vehicle level sender from lower transverse link -arrow-.



- A
- Cut through cable ties -arrows-. Open retainer for starter cable and take out electrical wiring.

17-18



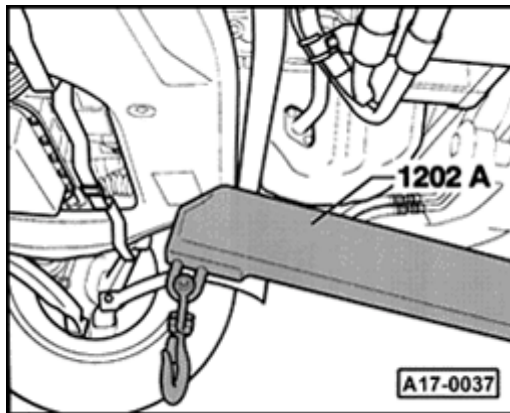
A

- Mark positions of mountings -1- and locating sleeves -2- on left and right engine mountings (lower).

Note:

Different mounting holes are provided for the different engine versions.

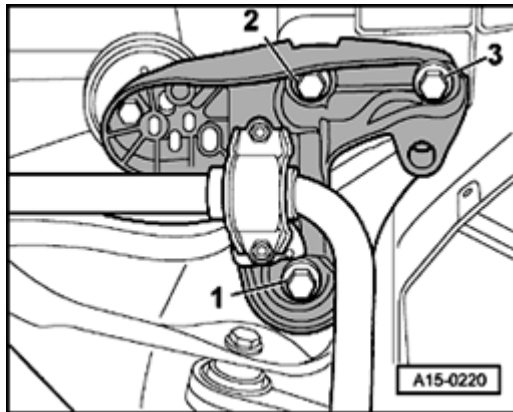
- Remove nut -1- from lower right of engine mounting.
- Completely remove left engine mounting.



A

- Support subframe with workshop crane VAG 1202 A.

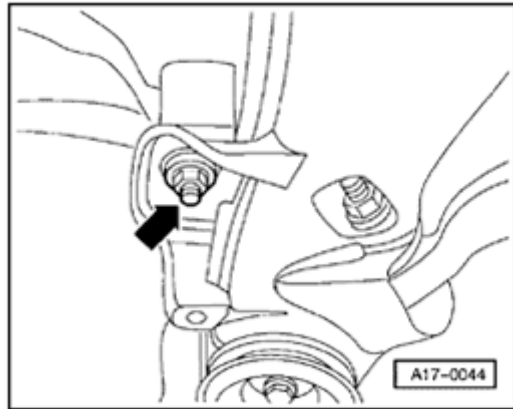
17-19



- Remove front subframe bolts -2- and -3- (left and right) and loosen bolts -1-.

Note:

The subframe should be disconnected and lowered at the front only, otherwise it will be necessary to check the wheel alignment.

Vehicles with manual transmission

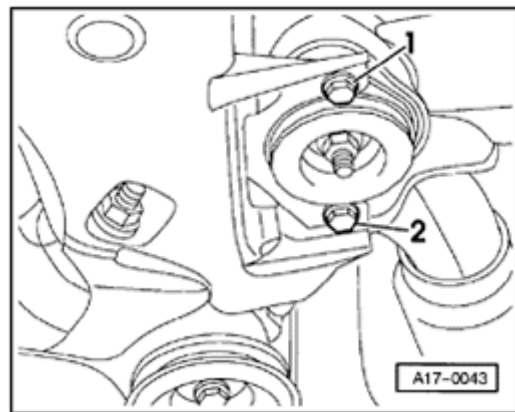
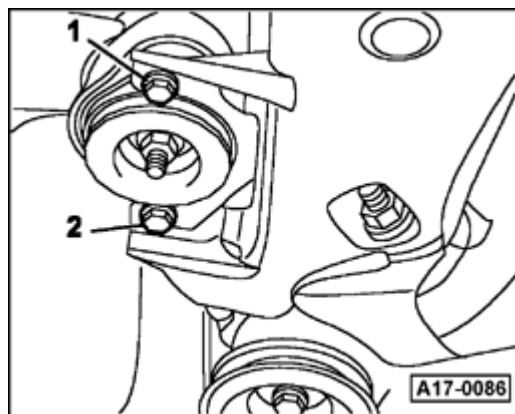
- Loosen nut -arrow- on left transmission mounting until it is flush with end of bolt (approx. four turns on the thread).

Vehicles with automatic transmission:

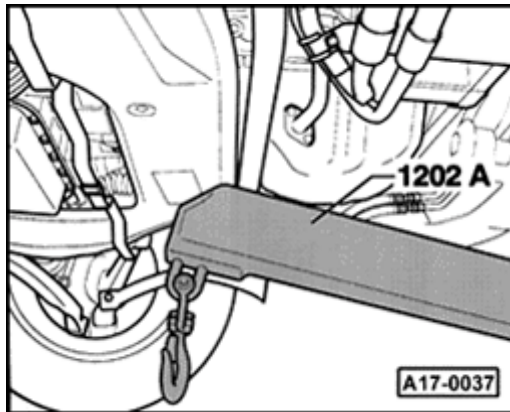
- Loosen rear bolt -2- on left transmission mounting a few turns; remove front bolt -1- on left transmission mounting.

All models:

- Loosen rear bolt -2- on right transmission mounting a few turns; remove front bolt -1- on right transmission mounting.

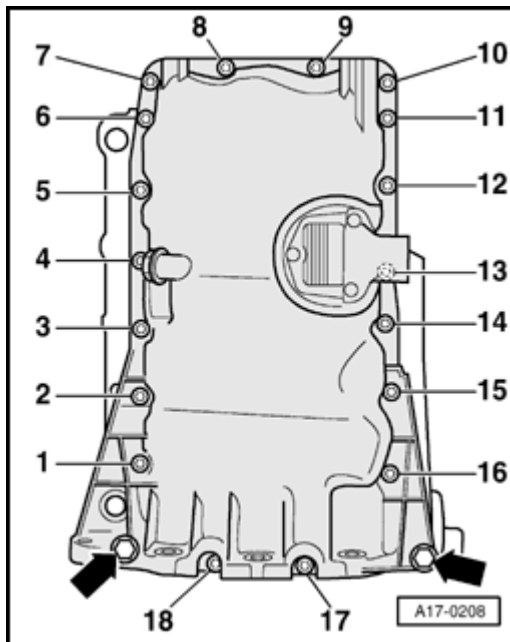


17-21



A

- Lower subframe slowly using workshop crane 1202 A.
- Take out workshop crane VAG 1202 A.
- Remove bolts for oil pan/transmission:



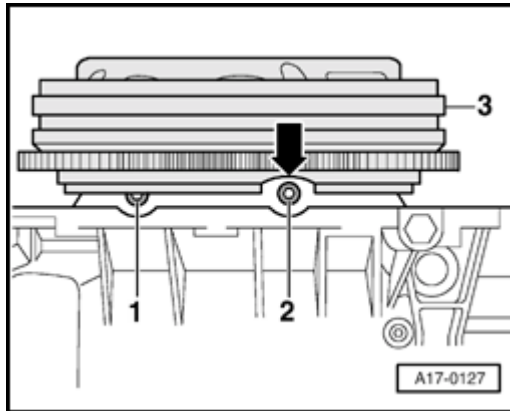
A

- Remove M10 bolts -arrows-.
- Loosen bolts -1 to 18- diagonally.

Note:

⚠ *Unscrew both rear oil pan bolts -1- and -2- with attachment 3249. Turn the flywheel on vehicles with a manual transmission -3- until the notch -arrow- is aligned with the bolt.*

- Take off oil pan. If necessary loosen it by striking lightly with a rubber hammer.
- Carefully remove sealant residues from cylinder block (remove baffle plate).

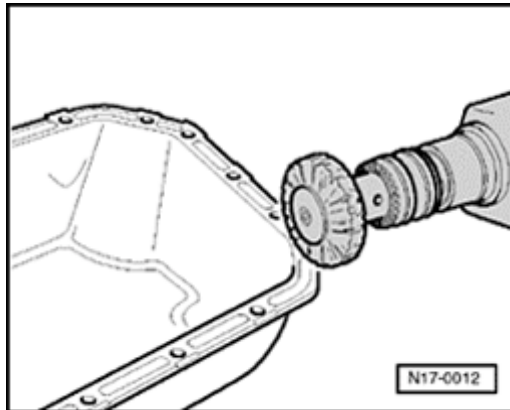


- ⚠
- Remove remaining sealant from oil pan, e.g. with a rotating plastic brush.

WARNING!

Wear protective glasses.

- Clean sealing surfaces: they must be free of oil and grease.

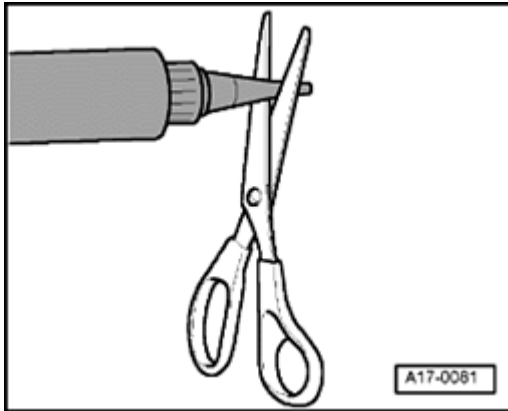


Installing

Installation is carried out in the reverse order of removal; note the following:

Note:

The oil pan must be installed within 5 minutes after applying the silicone sealant.

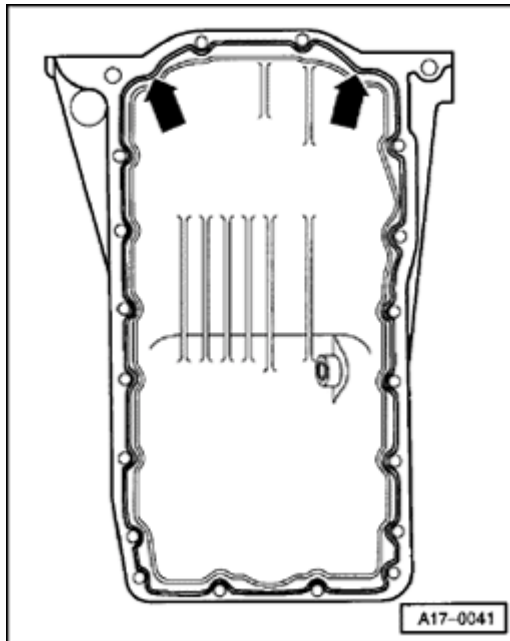


A

- Cut off nozzle of tube at front marking (diameter of nozzle approx. 3 mm).
 - ◆ Silicone sealant D 176 404 A2
 - ◆ Thickness of sealant bead: 2 to 3 mm

Note:

The bead of sealant must not be thicker than 3 mm, as otherwise excess sealant will enter the oil pan and obstruct the strainer in the oil intake pipe.



A

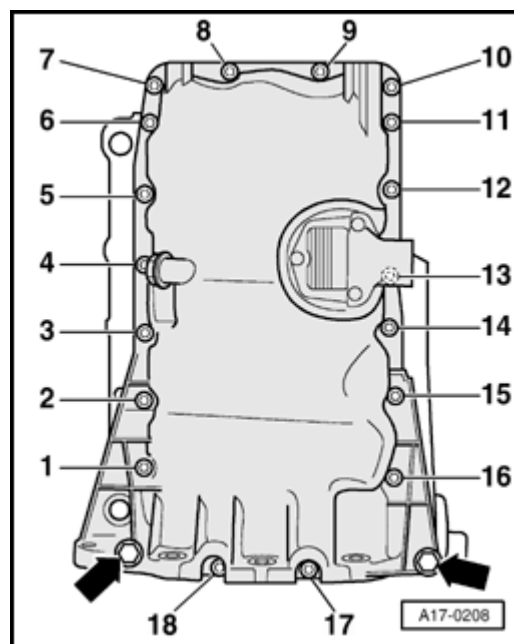
- Apply bead of silicone sealant onto clean sealing surface of oil pan, as illustrated. (Illustration shows position of sealant bead on cylinder block).

Note:

Be particularly careful when applying the bead of sealant around the rear sealing flange (arrows in illustration).

17-25

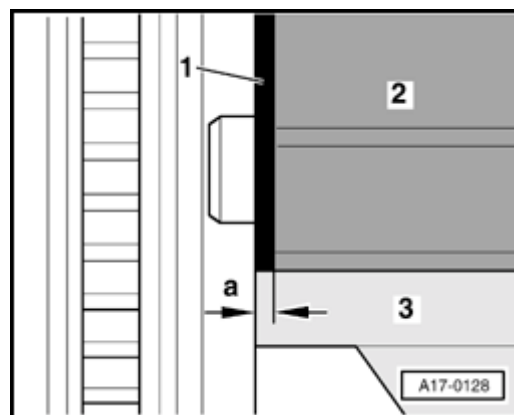
- Immediately attach oil pan and tighten bolts in described sequence:



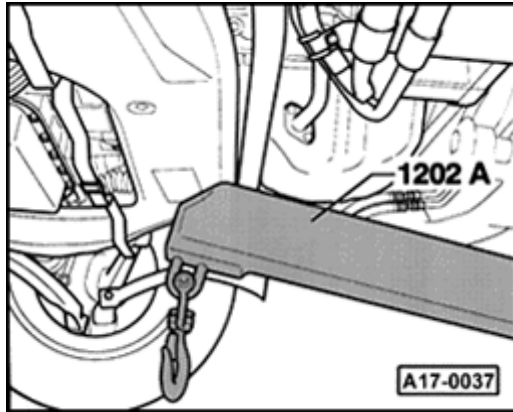
- Tighten bolts -1 to 18- diagonally to 5 Nm.
- Tighten bolts securing oil pan to transmission to 45 Nm.
- Tighten bolts M10 -arrows- to 40 Nm.
- Tighten bolts -1 to 18- tighten diagonally to 15 Nm.

Note:

- ◆ Replace seals and gaskets.



- ◆ When installing the oil pan with the engine removed from the vehicle, ensure that the oil pan -3- is positioned flush with the intermediate plate -1- at the flywheel end (i.e. oil pan should protrude dimension "a" = 0.8 mm from cylinder block with respect to the cylinder block -2-).
- ◆ After installing oil pan assembly, the sealant must dry for approx. 30 minutes. Only then may the engine be filled with oil.



A

- Support subframe with workshop crane VAG 1202 A.
- Installing subframe:

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 40](#)

Vehicles with automatic transmission:

- Secure ATF lines.

⇒ [Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37](#)

All models:

- Install lock carrier ⇒ [Page 13-1](#) .
- Fill engine with oil and check oil level.

Vehicles with automatic transmission:

- Check ATF level:

⇒ [Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37](#)

17-27

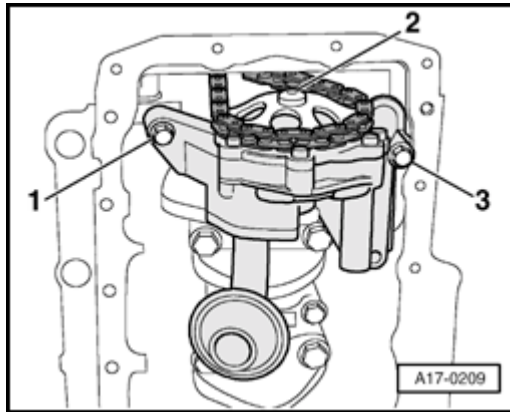
Tightening torques

Component	Nm
Oil pan to cylinder block	M7 15
	M10 40
Oil pan to transmission	45
Limit stop for torque reaction support on oil pan	28
Engine mounting to subframe	25
Engine mounting to engine support	25
Transmission support to transmission support	M10 40
Transmission mounting to subframe	
	M8 25
Oil return pipe to oil pan	10
Oil drain plug	30
Hose clamps for air duct hoses	3.5

Oil pump, removing and installing

Removing

- Remove oil pan and baffle plate ⇒ [Page 17-11](#) .
- Remove bolt -2-.
- Remove sprocket wheel from oil pump shaft.
- Remove bolts -1- and -3- and remove oil pump.



Installing

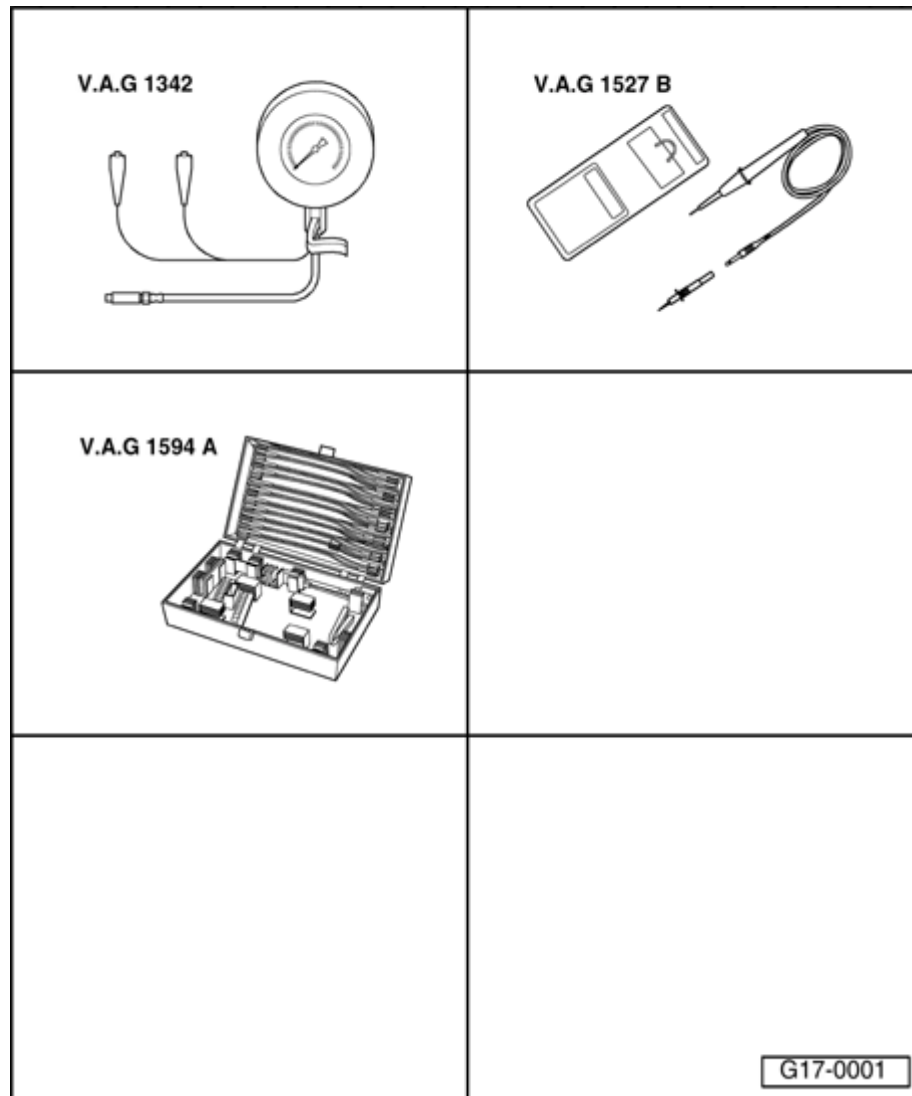
Installation is carried out in the reverse order of removal; note the following:

- Insert dowel sleeves -Item 12 -, ⇒ [Page 17-4](#) on top of oil pump.
 - ◆ Oil pump shaft/sprocket wheel location: Can only be installed in one position.
- Installing oil pan ⇒ [Page 17-23](#)

Tightening torques

Component	Nm
Chain sprocket to oil pump shaft	22
Oil pump to cylinder block	16

17-30



Oil pressure and oil pressure switch, checking

Special tools and equipment

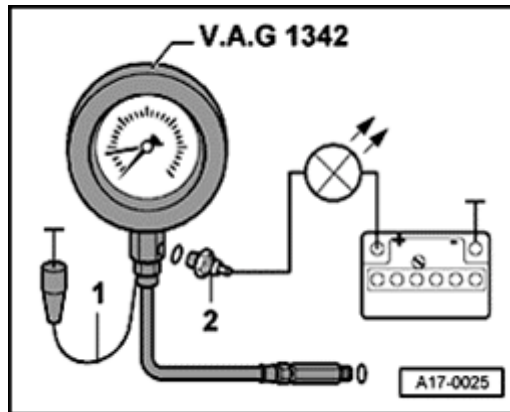
- ◆ VAG 1342
- ◆ VAG 1527 B
- ◆ VAG 1594 A

Test requirements:

- Oil level OK.
- Engine oil temperature approx. 80° C.
- Oil pressure warning lamp -K3- must come on when ignition is switched on.
- In vehicles with auto check system the "OK" display must appear (call up symbol).

Testing oil pressure switch

- Disconnect wire from oil pressure switch.
- Remove oil pressure switch and screw in oil pressure tester VAG 1342.
- Thread oil pressure switch -2- into VAG 1342.
- Connect brown wire -1- of tester to Ground (-).



- Connect voltage tester VAG 1527 B to oil pressure switch and positive side of battery (+) using test leads from VAG 1594 A.
- Test lamp should not light up.
- If test lamp lights up, install new oil pressure switch.
- Start engine.

Note:

The switching point of the oil pressure switch can be reached when the engine is cranked on the starter motor, so watch the tester and the test lamp while starting the engine.

Black oil pressure switch:

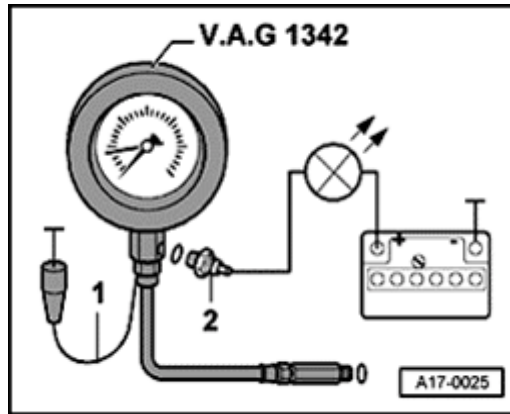
- LED must light up at 1.2 to 1.6 bar.
- If test lamp does not light up, install new oil pressure switch.

Check oil pressure

- Disconnect wire from oil pressure switch.
- Remove oil pressure switch and screw in oil pressure tester VAG 1342.
- Thread oil pressure switch -2- into VAG 1342.
- Start engine (engine oil temperature approx. 80 ° C).
 - Oil pressure at idling speed: at least 1.3 bar
 - Oil pressure at 2000 rpm: 3.5 to 4.5 bar

If specified values are not attained:

- Pressure relief valve or oil pump faulty, replace oil pump ⇒ [Page 17-28](#).



Engine oil

The engine is filled with a high quality multigrade oil at the factory. This oil may be used all year round, except in extremely cold climates.

Viscosity grades and oil specifications

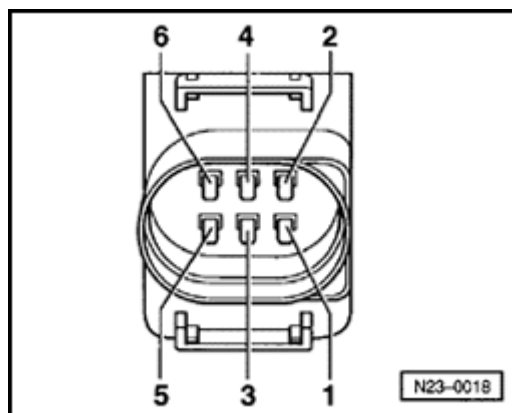
Viscosity grades and oil specifications:

⇒ [*Repair Manual, Maintenance*](#)

Engine oil level, checking

Test requirements:

- Engine oil temperature at least 60 ° C
- Vehicle must be level (horizontal)
- Wait a few minutes after switching off engine to allow oil to flow back into oil pan.
- Pull out dipstick, wipe with a clean cloth and insert again to stop.
- Pull out dipstick again and read oil level.



Markings on oil dipstick:

- a - Oil must not be topped up.
- b - Oil may be topped up. The oil level may rise as far as area -a- after topping up.
- c - Oil must be topped up. The oil level is sufficient if somewhere in area -b- (grooved area) after topping up.

Note:

The oil level must not be above marking -a- on the dipstick.

Cooling system components, removing and installing

WARNING!

Hot steam can escape when opening the cap on the expansion tank: Cover the cap with a cloth and open carefully.

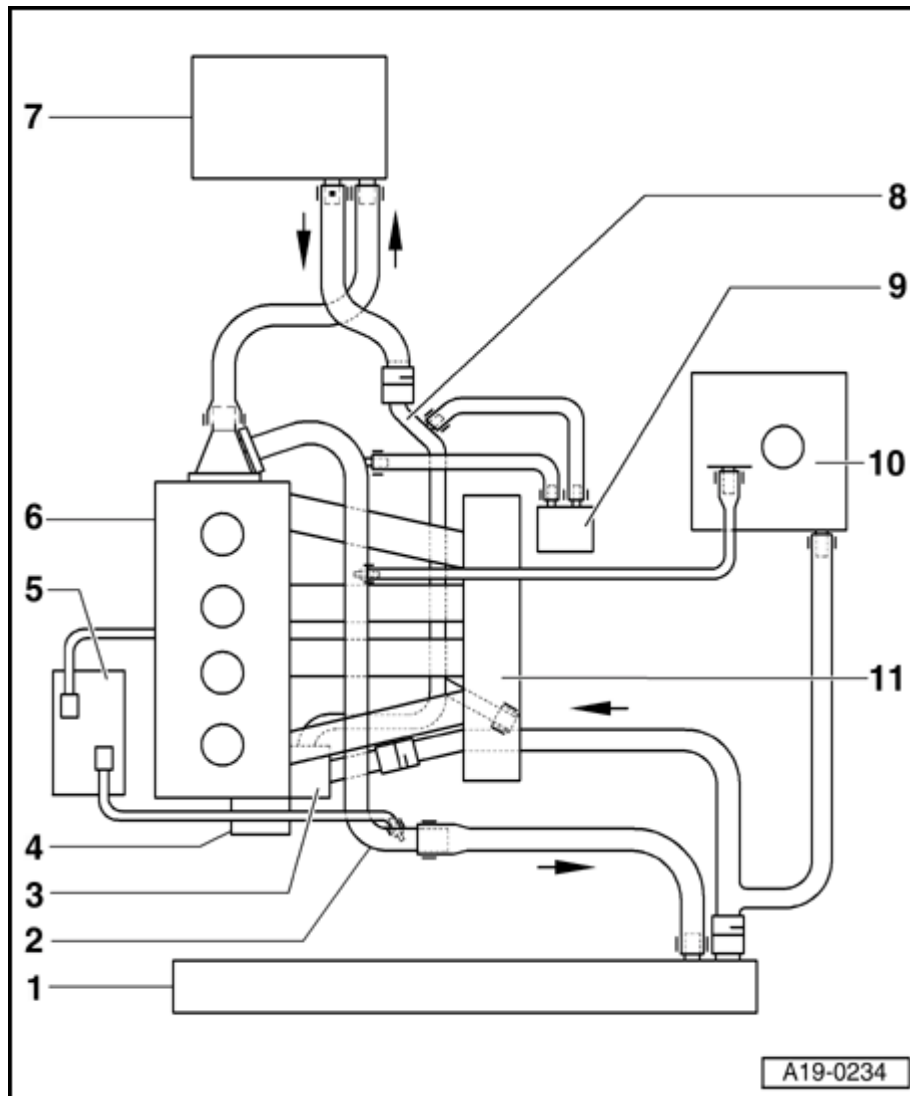
Note:

- ◆ *When the engine is warm the cooling system is under pressure. If necessary release pressure before beginning repair work.*
- ◆ *Secure all hose connections with the correct hose clips (same as original equipment):*

⇒ Parts Catalog

- ◆ *Hose clip pliers VAG 1921 are recommended when installing spring type clips.*
- ◆ *Replace all gaskets and seals.*
- ◆ *The arrow markings on the coolant lines and on the ends of the hoses must be aligned with each other.*

◆ *Removing and installing viscous fan* ⇒ [Page 13-21](#) .



Cooling system diagram

1 - Radiator

- ◆ Removing and installing ⇒ [Page 19-26](#)
- ◆ After replacing, fill with fresh coolant

2 - Upper coolant line

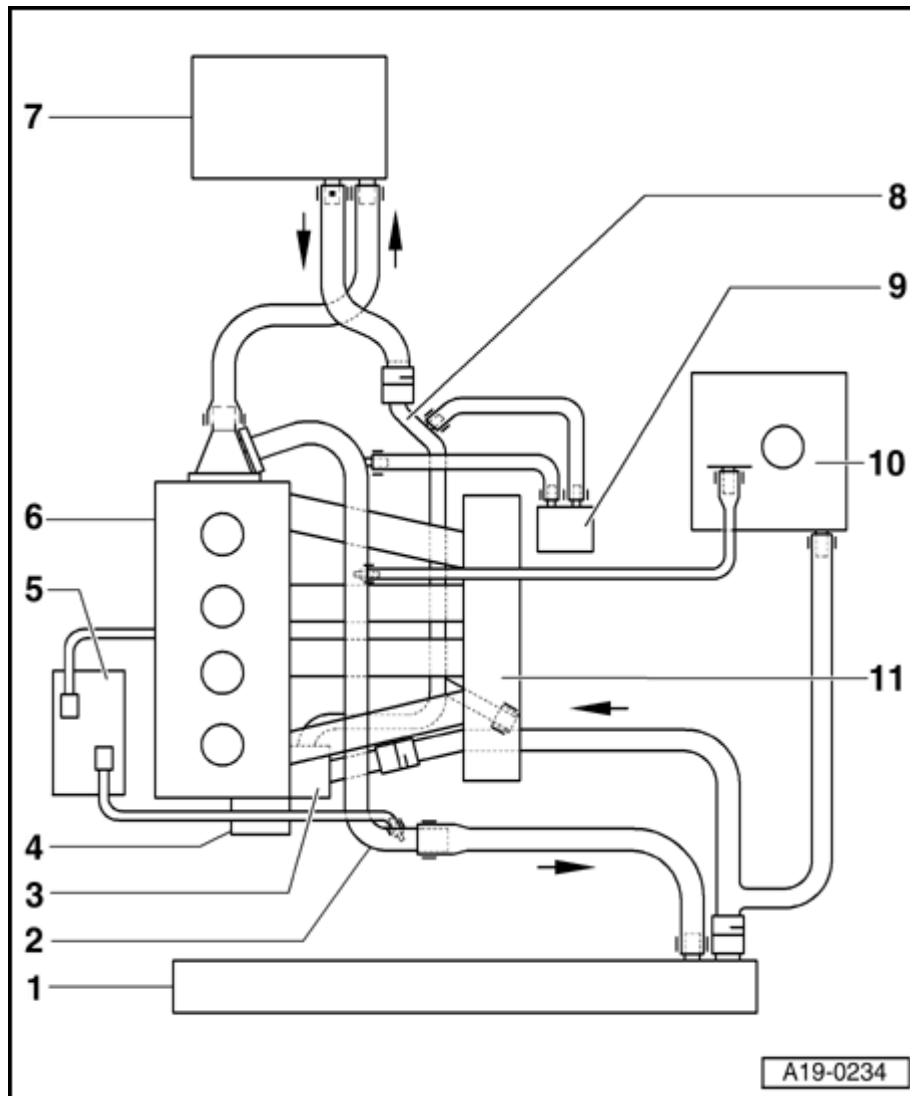
3 - Thermostat

- ◆ Removing and installing coolant pump ⇒ [Page 19-12](#)
- ◆ Checking ⇒ [Page 19-22](#)

4 - Coolant pump

- ◆ Removing and installing ⇒ [Page 19-12](#)
- ◆ Check for ease of movement

5 - Turbocharger

**6 - Cylinder head/cylinder block**

- ◆ After replacing, fill with fresh coolant

7 - Heating system heat exchanger

- ◆ After replacing, fill with fresh coolant

8 - Lower coolant line

- ◆ Removing and installing ⇒ [Page 19-23](#)

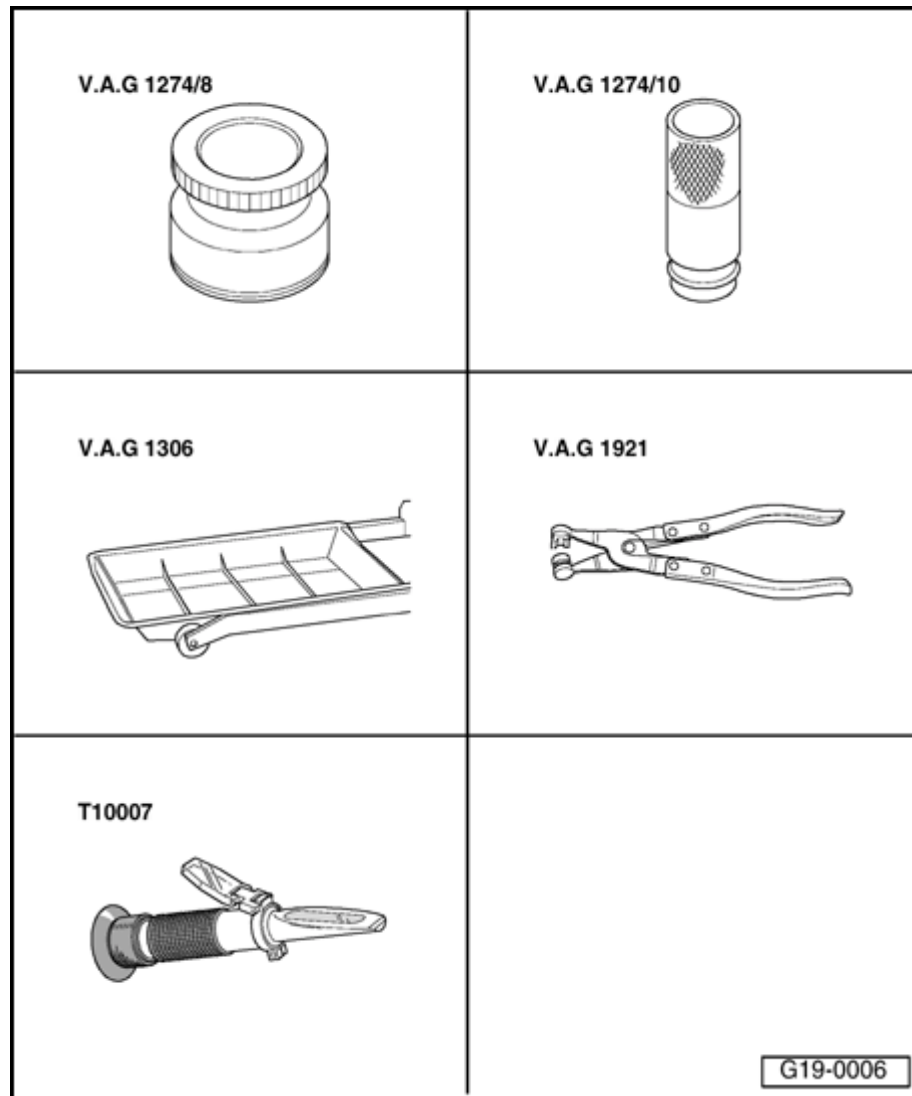
9 - Oil cooler

- ◆ Removing and installing ⇒ Item 23 , ⇒ [Page 17-10](#)

10 - Expansion tank

- ◆ With filler cap
- ◆ Testing pressure relief valve in filler cap ⇒ [Page 19-33](#)

11 - Intake manifold



Cooling system, draining and filling

Special tools and equipment

- ◆ Adapter 1274/8
- ◆ Line VAG 1274/10
- ◆ Drip tray VAG 1306
- ◆ Hose clamp pliers VAG 1921
- ◆ Special tool T10007

Draining

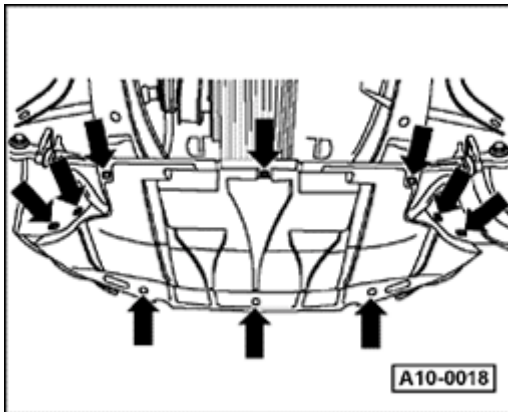
Note:

Catch drained off coolant in a clean container for re-use or disposal.

WARNING!

Hot steam can escape when opening the cap on the expansion tank: Cover the cap with a cloth and open carefully.

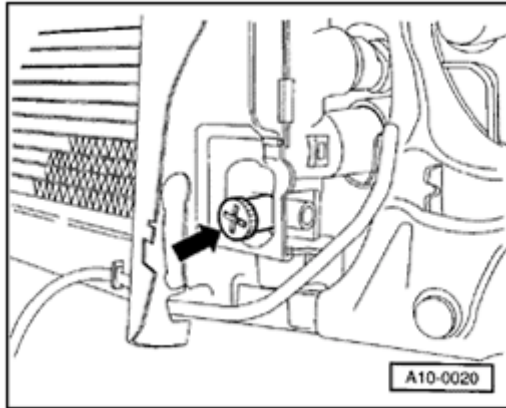
- Open cover of coolant expansion tank
- Remove sound insulation -arrows-.
- Place drip tray VAG 1306 below engine.



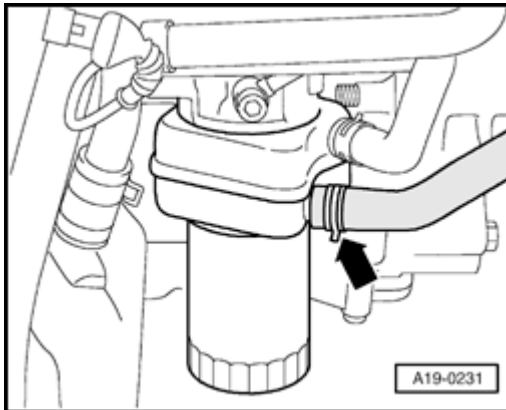
- Remove lower coolant hose retaining clip -arrow- and remove coolant hose from radiator.

Note:

- ▲ With bumper and air duct in front of charge air cooler removed, the coolant can also be drained from the radiator via the drain screw -arrow-. If necessary use an auxiliary hose.



- ▲ - Disconnect lower coolant hose on oil cooler -arrow-, and drain off remaining coolant.



Filling

Note:

- ◆ *The cooling system is filled all year round with a mixture of water and an antifreeze/corrosion protection agent.*
- ◆ *Only use coolant additive G 012 A8 D meeting specification TL VW 774 D. Identification color: red*

CAUTION!

G 012 A8 D and other coolant additives cannot be mixed. Otherwise, serious damage to the engine may result.

- ◆ *If the fluid in the expansion tank is brown, this means G 012 A8 D has been mixed with another type of coolant. In this case, flush out the cooling system and fill with fresh coolant. To flush the system, fill it with clean water and run the engine for about 2 minutes. This should remove as much of the old coolant as possible.*
- ◆ *G 012 A8 D and coolant additives marked "meeting specification TL VW 774 D" prevent frost and corrosion damage and stop scaling while at the same time raising the boiling point of the coolant. For these reasons the cooling*

system must be filled all year round with the correct anti-freeze and anti-corrosion additive.

- ◆ *Because of its high boiling point, the coolant improves engine reliability under heavy loads, particularly in countries with tropical climates.*
- ◆ *Protection against frost must be assured to about -25 ° C (in arctic climatic countries to about -35 ° C).*
- ◆ *The coolant concentration must not be reduced by adding water, even in warmer seasons and in warmer countries. The anti-freeze ratio must be at least 40 %.*
- ◆ *If greater frost protection is required in very cold climates, the amount of G 012 A8 D can be increased, but only up to 60% (this gives frost protection to about -40 ° C). Otherwise, frost protection is reduced again and cooling effectiveness is also reduced.*
- ◆ *Only use clean drinking water for mixing the coolant.*
- ◆ *If radiator, heat exchanger, cylinder head or cylinder head gasket is replaced, do not reuse old coolant.*
- ◆ *Use special tool T10007 to check frost protection of coolant additive G012 A8 D in*

cooling system.

Recommended mixture ratios:

Frost protection to	Anti-freeze concentration	G 012A8 D ¹⁾	Water ¹⁾
-25 ° C	40%	3.0 l	4.0 l
-35 ° C	50%	3.5 l	3.5 l

¹⁾ Coolant quantity: 7.0 liters (may vary depending upon the vehicle equipment)

- Install lower coolant hose and secure.

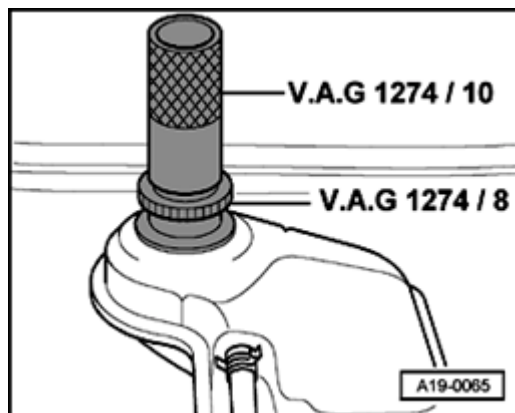
A

- Screw adapter VAG 1274/8 onto coolant expansion tank.

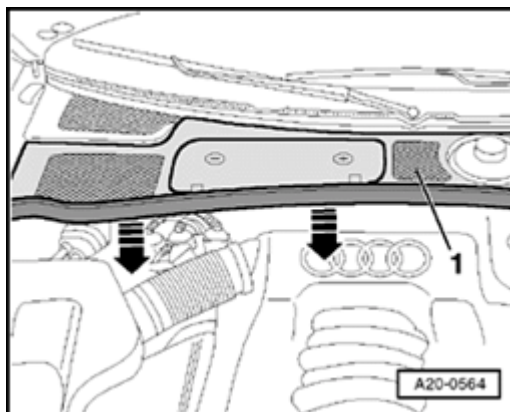
- Fit special tool VAG 1274/10 onto adapter.

Note:

To fill expansion tank without special tools, remove expansion tank and temporarily raise it about 100 mm.

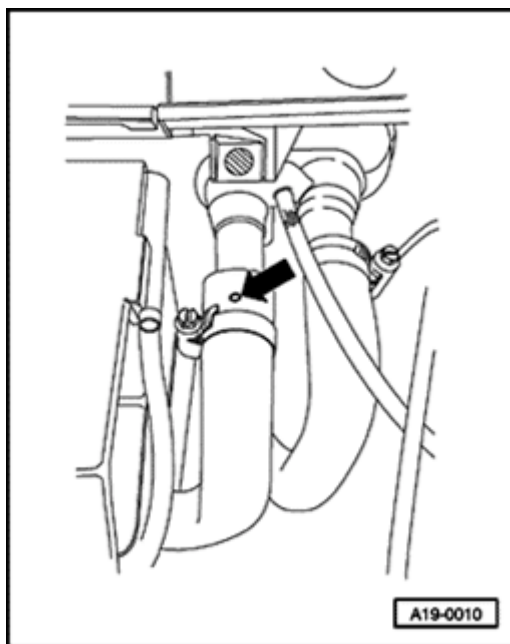


19-10



A

- Remove seal from plenum chamber cover in direction of arrow.
- Remove plenum chamber cover -1- from front.
- Push back protective cover for coolant hose at connection of heat exchanger.



A

- Release coolant hose to heat exchanger and pull back hose until bleeder hole in coolant hose -arrow- is no longer covered by connection.
- Top up coolant until it flows out at bleeder hole in coolant hose.
- Push coolant hose on connection and tighten.
- Install expansion tank cap.

- Start engine and maintain an engine speed of about 2000 rpm for approx. 3 minutes.
- Allow engine to run at idling speed until lower hose on radiator becomes hot.

WARNING!

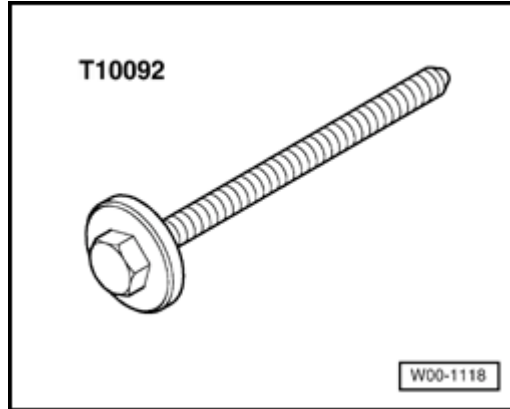
Hot steam can escape when opening the cap on the expansion tank: Cover cap with a cloth and open carefully.

- Check coolant level and top up if necessary. If engine is warm, coolant level must be at max. mark; if cold, between min. and max. marks.
- Stop engine.

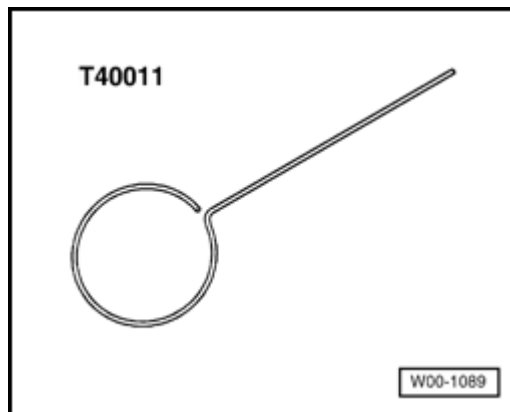
19-12

Coolant pump, removing and installing

Special tools and equipment



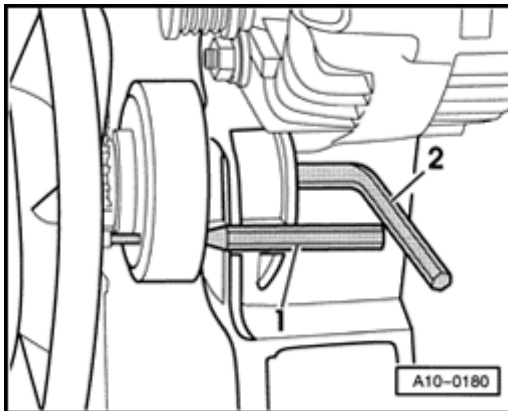
- ◆ Socket head fastener T10092



- ◆ Pin T40011

Removing

- Engine in vehicle.
- Lock carrier must be in service position ⇒ [Page 13-1](#) .
- Drain coolant ⇒ [Page 19-4](#) .
- Remove ribbed belt and tensioner for ribbed belt ⇒ [Page 13-18](#) .
- ✦ - Secure pulley for viscous fan with pin punch -1- and unfasten using Allen key -2-.
- Remove viscous fan from mounting.

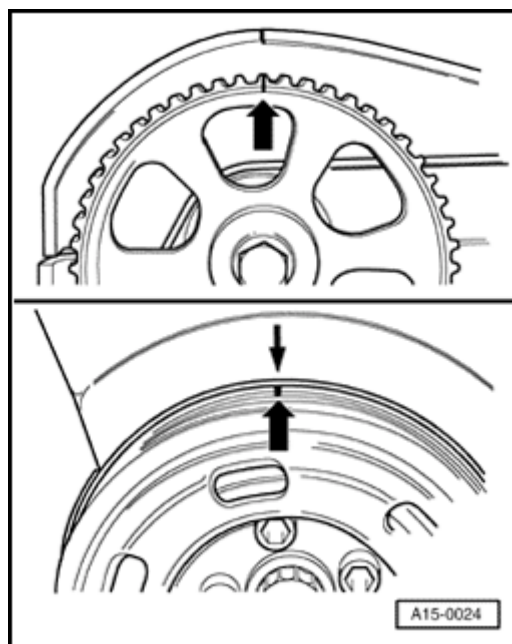


- ✦ - Remove engine cover -arrows-.

19-14

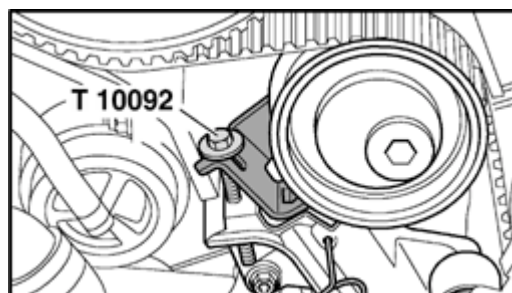
- Mark direction of rotation of belt with chalk or felt pen.

- Remove top and center toothed belt guard ⇒ [Page 13-35](#) .



A

- Set crankshaft to markings for TDC of No. 1 cylinder by turning central bolt on crankshaft sprocket in direction of rotation -arrows-.



A

- Thread socket head fastener T10092 into tensioner for toothed belt.

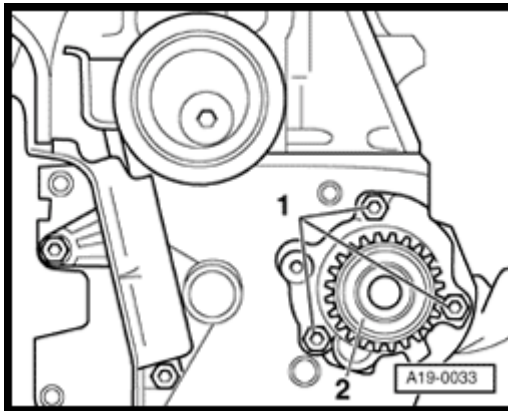
Note:

Only tension pressure piston of tensioner until the piston is secured with pin T40011.

- Take toothed belt off camshaft sprocket and coolant pump.

Note:

- ◆ *The vibration damper and lower toothed belt guard do not have to be removed.*
- ◆ *The toothed belt should be left in position on the crankshaft sprocket.*
- ◆ *Before removing the coolant pump, cover toothed belt with a cloth to protect from coolant.*

**A**

- Remove coolant pump securing bolts -1- and remove coolant pump -2-.

Installing

Installation is carried out in the reverse order of removal; note the following:

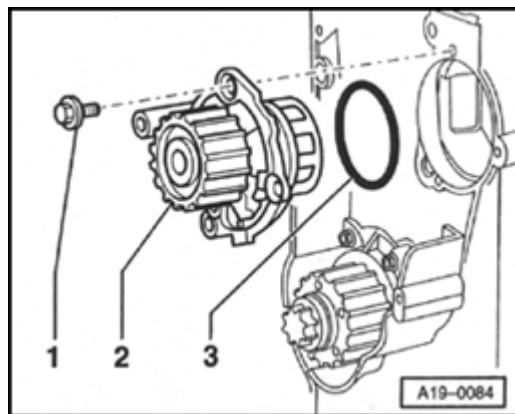
Note:

Always replace seals and gaskets.

- Clean and smooth down sealing surface for O-ring as required.
- Lightly coat new O-ring -3- with coolant G 012 A8 D.
- Install coolant pump -2-.
 - ◆ Installation position: Sealing plug in housing faces downward.
- Tighten bolts -1- of coolant pump to 15 Nm.
- Install toothed belt (adjust valve timing) ⇒ [Page 13-44](#) .

Note:

Observe all instructions on removing and installing the toothed belt ⇒ [Page 13-40](#) .



- Install ribbed belt and tensioner for ribbed belt ⇒ [Page 13-20](#) .
- Install viscous fan ⇒ [Page 13-21](#) .
- Install lock carrier ⇒ [Page 13-1](#) .
- Top up coolant ⇒ [Page 19-7](#) .

Tightening torque

Component	Nm
Coolant pump to cylinder block	15
Center section of toothed belt guard to cylinder block	10 1)
Hose clamps for coolant hoses	2

1) Install with locking fluid D 000 600 A2

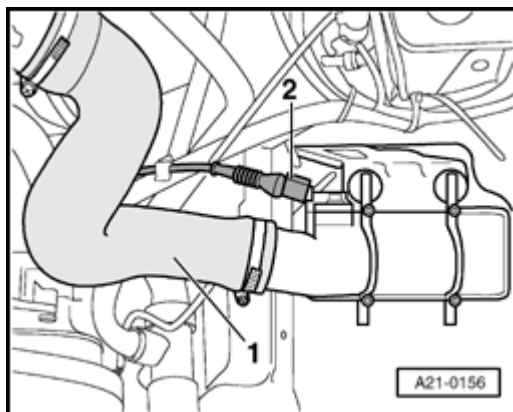
Coolant thermostat, removing and installing, checking

Removing

- Observe or obtain radio code on vehicles with coded radio.
- Disconnect Ground strap at battery with ignition switched off.
- Drain coolant ⇒ [Page 19-4](#) .
- ✦ - Remove air duct hose -1-.

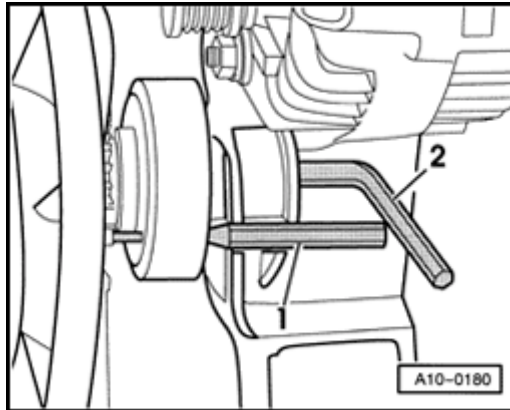
Note:

Connector -2- remains plugged in.



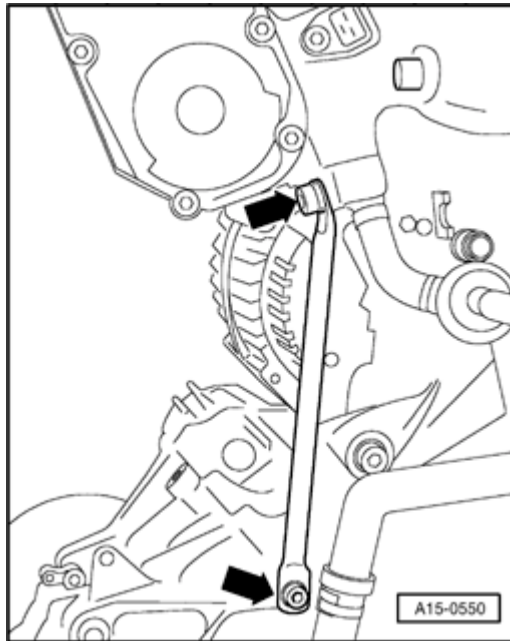
- ✦ - Loosen ribbed belt by turning tensioner in direction of arrow.
- Remove ribbed belt from Generator pulley.

19-19



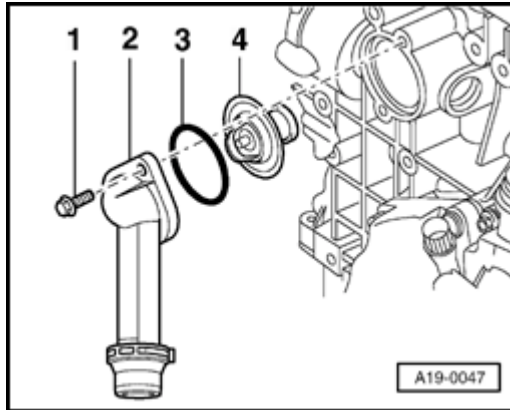
A

- Secure pulley for viscous fan with pin punch -1- and unfasten using Allen key -2-.
- Remove viscous fan from mounting and place in front of radiator cowl.
- Disconnect wiring from rear of Generator.
- Loosen connections for Generator from top and bottom and remove Generator.



A

- Remove intake line support -arrows-.



A

- Release clip and disconnect coolant hose from connection -2-.
- Remove bolts -1- remove connection, O-Ring -3- and coolant thermostat -4-.

Installing

Installation is carried out in the reverse order of removal; note the following:

Note:

Always replace seals and gaskets.

- Clean and smooth down sealing surface for O-ring as required.
- Lightly coat new O-ring with coolant G 012 A8 D.
- Insert coolant thermostat.
 - ◆ Installation position: Cross-piece on thermostat should be vertical.

- Install viscous fan ⇒ [Page 13-21](#) .
- Install ribbed belt and tensioner for ribbed belt ⇒ [Page 13-20](#) .
- After connecting battery, enter anti-theft code for radio.

⇒ *Radio operating instructions*

- Close windows fully using power window switches.
- Actuate all power window switches again for at least one second in the "close" direction to activate automatic open/close function.
- Set clock to correct time.
- Top up coolant ⇒ [Page 19-7](#) .

Tightening torques

Component	Nm
Connection to cylinder block	15
Support for intake manifold	
to intake manifold	20
to bracket	20
Generator at bracket	
M8	23
M10	46
Hose clamps for air duct hoses	
	3.5

Check coolant thermostat

- Heat thermostat in water bath.

Starts to open	Fully open	Opening travel
approx. 87 ° C	approx. 102 ° C ¹⁾	at least 8 mm

¹⁾ cannot be tested

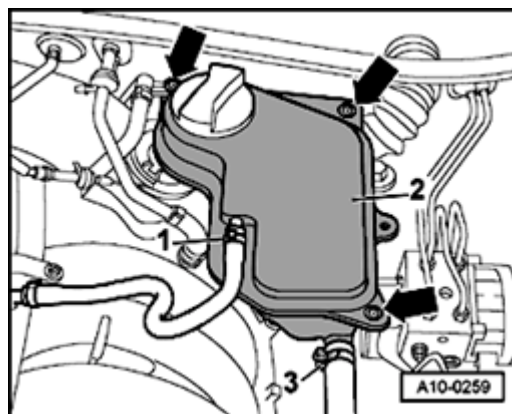
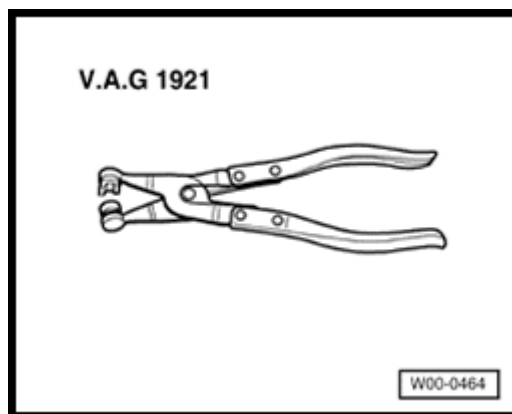
Lower coolant line, removing and installing

Special tools and equipment

- ◆ VAG 1921

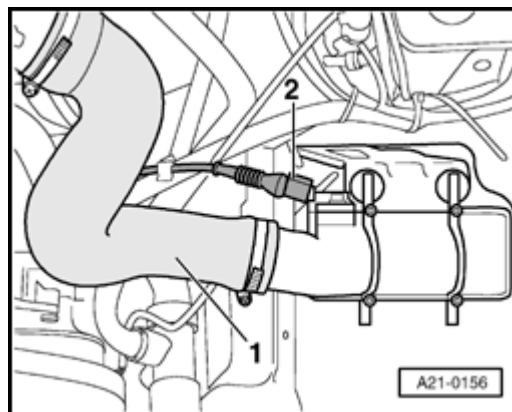
Removing

- Drain coolant ⇒ [Page 19-4](#) .



- Disconnect coolant hoses -1- and -3-.
- Unbolt coolant expansion tank -2- (-arrows-).
- Disconnect electrical wiring to coolant level display switch -F66- on underside of expansion tank.

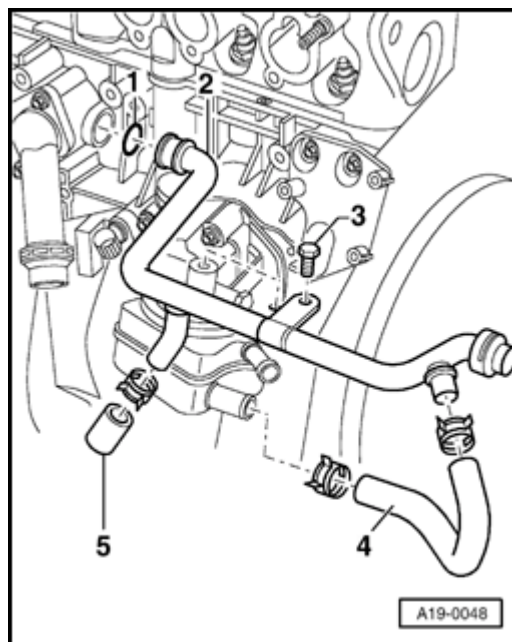
19-24



- Remove air duct hose -1-.

Note:

Connector -2- remains plugged in.



- Disconnect heater hose at rear of coolant line -2-. To do this, release retaining clip on connecting flange.
- Pull off coolant hose to oil cooler -4- at coolant line.
- Remove bolt -3-.
- Push lower coolant line toward rear of vehicle and remove.
- Remove plug -5- if necessary.

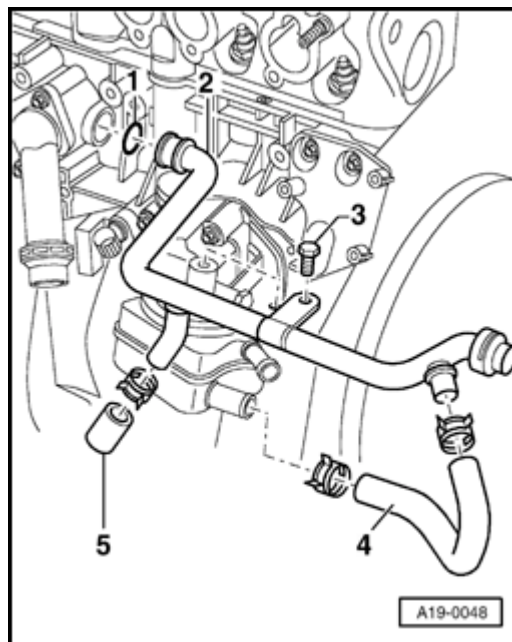
Installing

Installation is carried out in the reverse order of removal; note the following:

Note:

Always replace seals and gaskets.

- Before installing, clean and smooth down sealing surface for O-ring.
- **A** - Moisten new O-ring -1- with G 012 A8 D coolant and slide onto coolant line -2-.
- Push coolant line into opening in cylinder block.
- Top up coolant ⇒ [Page 19-7](#) .



Tightening torques

Component	Nm
Coolant line to oil filter bracket	20
Hose clamps for coolant hoses	2
Hose clamps for air duct hoses	3.5

Radiator, removing and installing

Special tools and equipment

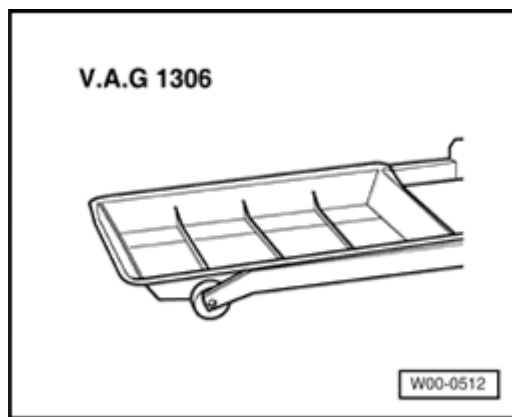


- ◆ VAG 1306

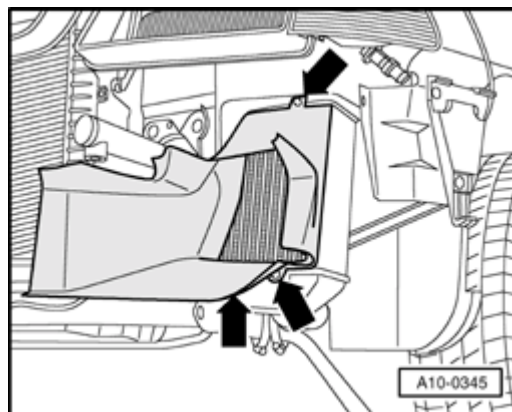
Removing

- Remove front bumper:

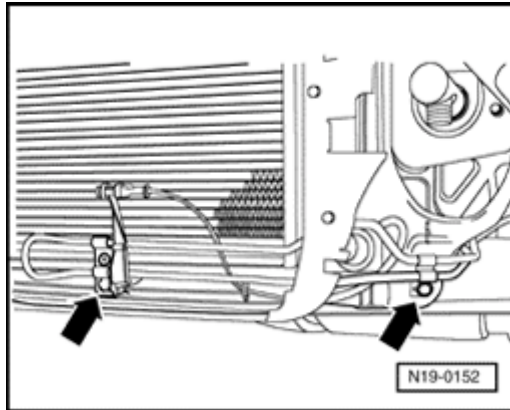
⇒ [Repair Manual, Body Exterior, Repair Group 63](#)



- Remove air cowl in front of charge air cooler -arrows-.



19-27



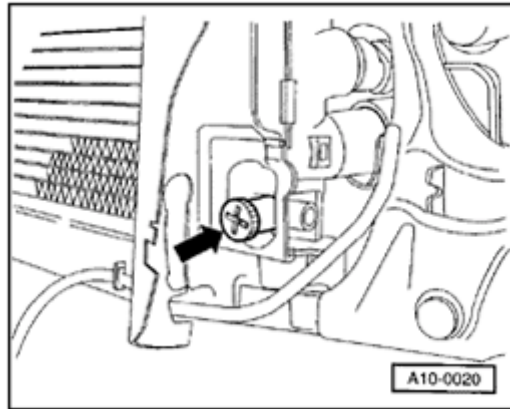
A

- Disconnect cooling lines for power steering hydraulic fluid -arrows-.

WARNING!

**Hot steam can escape when opening the cap on the expansion tank:
Cover cap with a cloth and open carefully.**

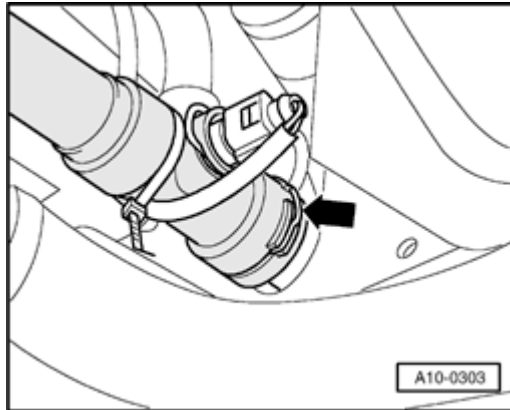
- Open cover of coolant expansion tank
- Place drip tray VAG 1306 below engine.



A

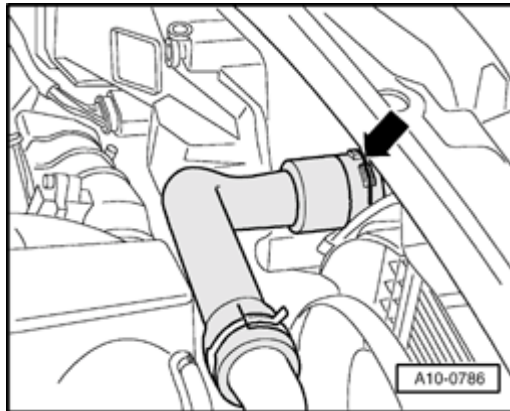
- Turn drain screw -arrow- on radiator counter-clockwise. If necessary, install a drain hose on connection.

19-28



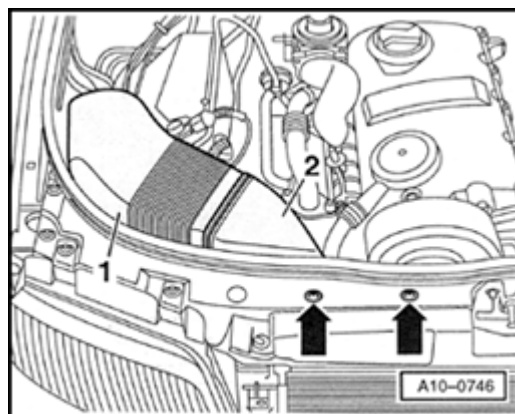
A

- Release coolant hose retaining clip -arrow- and remove coolant hose from radiator.



A

- Disconnect coolant hose from top of radiator -arrow-.

**Vehicles with automatic transmission:****A**

- Remove bolts -arrows-.
- Remove air duct -1- and -2-.

Note:

Observe cleanliness rules when working on the automatic transmission:

⇒ [Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37](#)

- Place drip tray underneath to collect oil.
- Remove ATF lines/hoses from radiator:

⇒ [Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37](#)

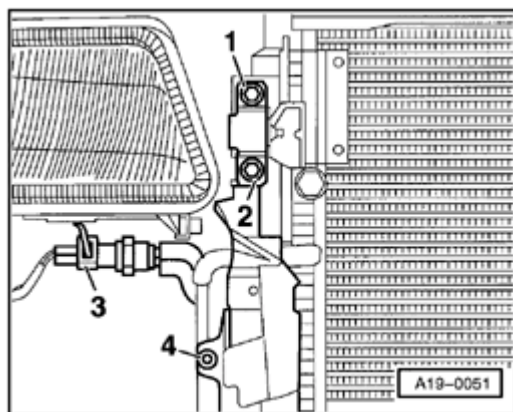
- Tie ATF lines to longitudinal member to avoid leakage of fluids.

All models:**CAUTION!**

The air conditioner refrigerant circuit must not be opened.

Note:

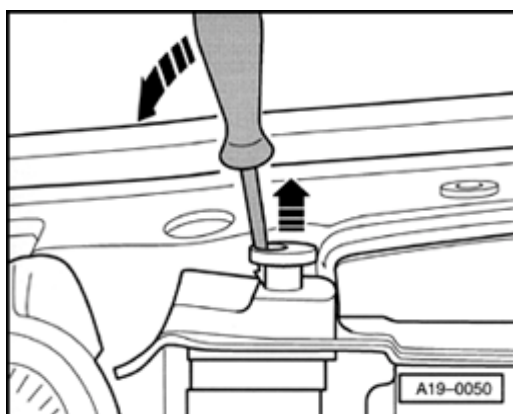
To prevent damage to the condenser and refrigerant lines/hoses, ensure that the lines and hoses are not stretched, kinked or bent.

**A**

- Remove air cowls from radiator -4- (left and right).
- Remove securing bolts -1- and -2- for condenser.
- Disconnect connector -3- from air conditioner pressure switch -F129-.
- Pull condenser up out of its bracket, pivot toward side and secure to right-hand front wheel with wire.

Note:

Protect fender panel from damage.

**A**

- Release two retaining pins for radiator and pull out upward -arrows-.
- Pivot radiator toward front and lift out.

Installing

Installation is carried out in the reverse order of removal; note the following:

- Install front bumper:

⇒ [*Repair Manual, Body Exterior, Repair Group 63*](#)

- Top up coolant ⇒ [*Page 19-7*](#) .

Vehicles with automatic transmission:

- Attach ATF lines.

⇒ [*Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37*](#)

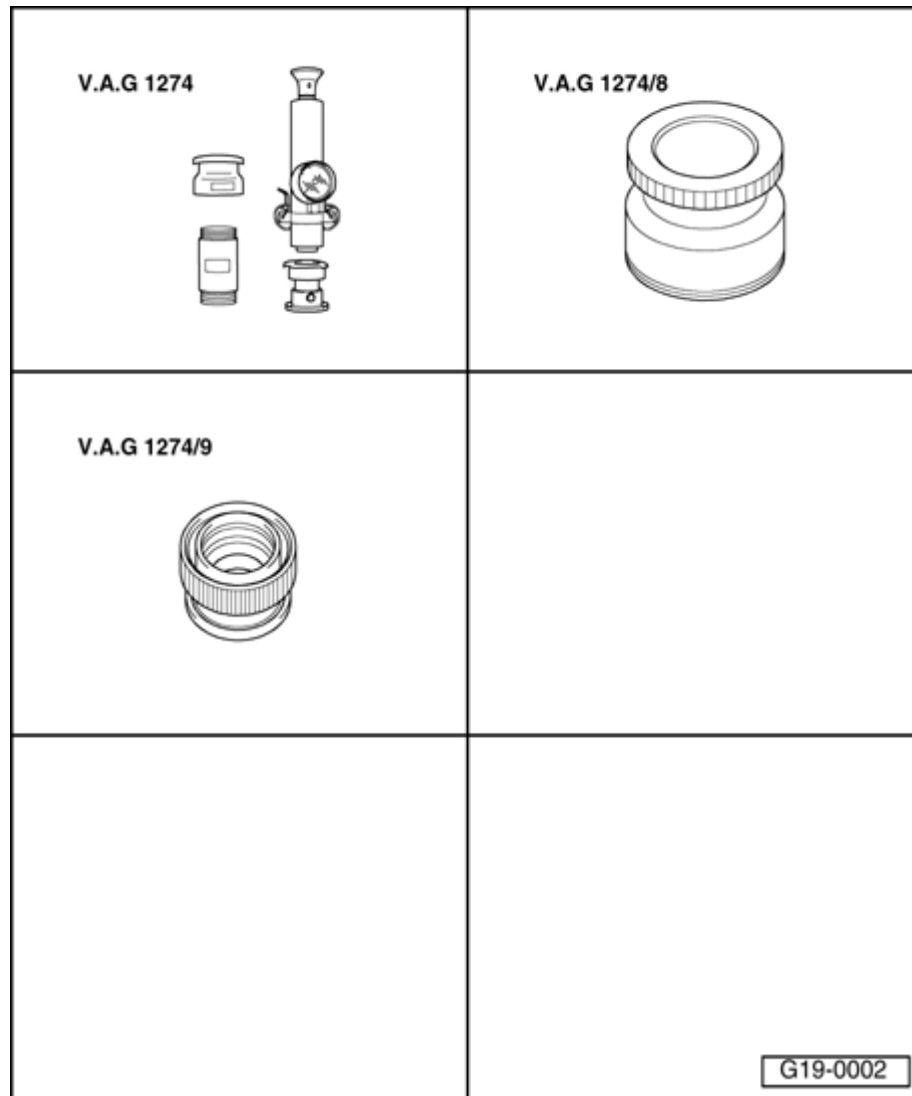
- Check ATF level:

⇒ [*Repair Manual, 5 Spd. Automatic Transmission 01V, Repair Group 37*](#)

Tightening torques

Component	Nm
Condenser to radiator	10
Cooling lines to radiator	10
Hose clamps for coolant hoses	2

19-32



Cooling system, checking for leaks

Special tools and equipment

- ◆ VAG 1274
- ◆ Adapter 1274/8
- ◆ Adapter 1274/9

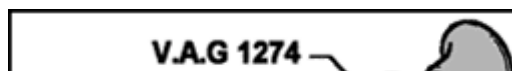
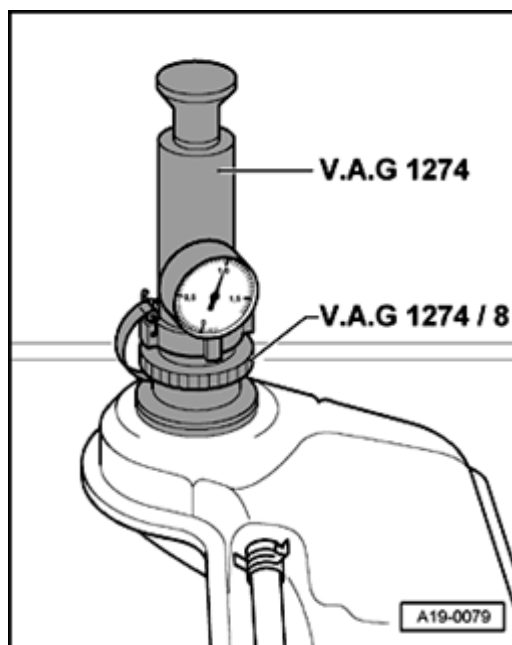
Test requirements:

- Engine at operating temperature.

WARNING!

Hot steam can escape when opening the cap on the expansion tank: Cover cap with a cloth and open carefully.

- Open cover of coolant expansion tank
- Install tester VAG 1274 with adapter VAG 1274/8 onto expansion tank.
- Using hand pump on tester, build up a pressure of approx. 1.0 bar.
- If this pressure is not maintained, locate and repair leaks.

Testing pressure relief valve in filler cap

- Install tester VAG 1274 with adapter VAG 1274/9 onto sealing cover.
- Operate hand pump.
 - Pressure relief valve must open at a pressure of 1.4 to 1.6 bar.