Workshop Manual

Audi A4 2008 ➤
Audi A5 Cabriolet 2009 ➤
Audi A5 Coupé 2008 ➤

Brake system

Edition 03.2019

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List of Workshop Manual Repair Groups

Repair Group

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45 - Anti-lock brake system
46 - Brakes - mechanism
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Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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00 – Technical data

1 Identification

(ARL006359; Edition 03.2019)

⇒ "1.1 PR number and type of brake system", page 1

1.1 PR number and type of brake system

The tables appearing below explain the PR numbers. These are important to obtain the correct combination of brake calipers/ brake discs and brake pads.

Brake system
Diagonally split dual-circuit braking system with ABS, EBPD, EDL, ASR, ESP, ECD and EPB

Front brakes (PR 1LA/1LB/1LD/1LJ/1LT/1ZT)				
Factory code (PR No.)		1LT/1LY	1LA/1LB	S4/S5 + 1LJ/1LD/ 1ZT
Brake caliper		FN3 (16")	FBC (16")	FBC (17")
Brake disc, ventilated	∅ mm	314	320	345
Brake disc, thickness	mm	25	30	30
Brake disc, wear limit	mm	23	28	28
Brake pad thickness (including back-plate and damper plate)	mm	20.3	20.3	20.3
Brake pad wear limit (including back-plate and damper plate)	mm	10	10	10

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Note

- *Maximum lateral run-out of steel brake disc: 0.06 mm*
- *Perform measurement with brake disc installed.*
- *Use dial gauge bracket VAS 6079/1 and dial gauge VAS 6079.*
- *Remove any dirt and rust from brake disc.*
- *Perform measurement 10 mm from outer edge of brake disc.*

⇒ "1 Front brakes", page 50

Front brakes (PR 1LM/1ZL)		
Brake disc, ventilated	∅ mm	365
Brake disc, thickness	mm	34
Brake disc, wear limit	mm	32
Brake caliper, Brembo, 8 pistons	∅ mm	32 / 28

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

Note

- *Maximum lateral run-out of steel brake disc: 0.06 mm*
- *Perform measurement with brake disc installed.*
- *Use dial gauge bracket VAS 6079/1 and dial gauge VAS 6079.*
- *Remove any dirt and rust from brake disc.*
- *Perform measurement 10 mm from outer edge of brake disc.*

⇒ “1 Front brakes”, page 50

Note

- *When performing repair work on brakes, hairline cracks are often found on the friction surface of the brake discs. Hairline cracks up to a length of 10 mm do not present a technical problem and do not justify a renewal of brake discs.*
- *Brake discs with cracks going all the way across the friction surface must be renewed.*

Ceramic front brakes (PR 1LW)		
Brake caliper		Brembo
Brake disc, ventilated	∅ mm	380
Brake disc, thickness	mm	38
Brake disc, wear limit		The minimum thickness of the brake disc is stamped onto the brake disc hub as a wear limit specification.
Brake caliper, 6 piston monoblock	∅ mm	2 x 32/ 36/ 38
Minimum brake pad thickness including backplate and damper plate	mm	9.5

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WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

⇒ “1 Front brakes”, page 50

Note

Depending on the version, the minimum weight of the brake disc is stamped on the disc. The brake disc must then be additionally weighed in order to assess the amount of wear. The disc must be renewed when the minimum weight is reached.

Note

Hairline cracks on the friction surfaces of ceramic brakes can be caused during manufacturing and therefore already appear to varying degrees when the brakes are new. Hairline cracks on the friction surfaces do not justify a renewal of the ceramic brake discs.

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Note

On these models ceramic brake discs are installed only at the front of the vehicle.

Rear brakes (PR 1KW/1KE/1KP/2EH)			
Factory code (PR No.)		1KW/2EH	S4/S5 + 1KE/1KP
Brake caliper		CII-43 EPB (16”)	CII-43 EPB (17”)
Brake disc	∅ mm	300	330
Brake disc (not ventilated), thickness	mm	12	---
Brake disc (ventilated), thickness		---	22
Brake disc, wear limit	mm	10	20
Brake pad thickness (including backplate and damper plate)	mm	17.5	17.5

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

Note

- *Maximum lateral run-out of steel brake disc: 0.06 mm*
- *Perform measurement with brake disc installed.*
- *Use dial gauge bracket VAS 6079/1 and dial gauge VAS 6079.*
- *Remove any dirt and rust from brake disc.*
- *Perform measurement 10 mm from outer edge of brake disc.*

Rear brakes (PR GP0/GP1/GP2/1KZ)			
Factory code (PR No.)		GP0/GP1	GP2 2ED 1KZ
Brake disc	∅ mm	330	330
Brake disc, thickness	mm	22	22
Brake disc, wear limit	mm	20	20

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

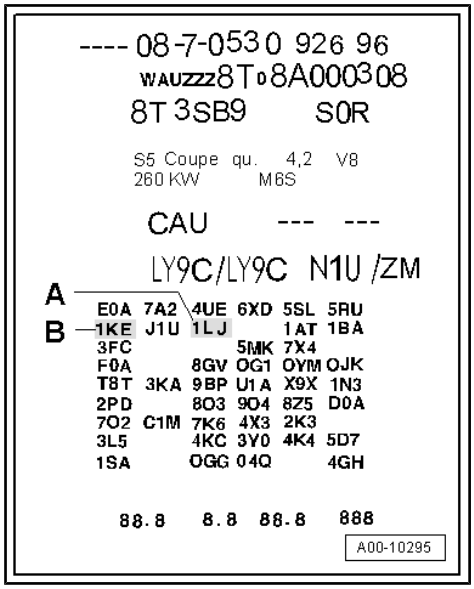
Note

- *Maximum lateral run-out of steel brake disc: 0.06 mm*
- *Perform measurement with brake disc installed.*
- *Use dial gauge bracket VAS 6079/1 and dial gauge VAS 6079.*
- *Remove any dirt and rust from brake disc.*
- *Perform measurement 10 mm from outer edge of brake disc.*

⇒ "2 Rear brakes", page 123

The type of brake system installed in the vehicle is indicated by the corresponding PR number -A and B- on the vehicle data sticker.

A model with type number 8T is shown in this example.



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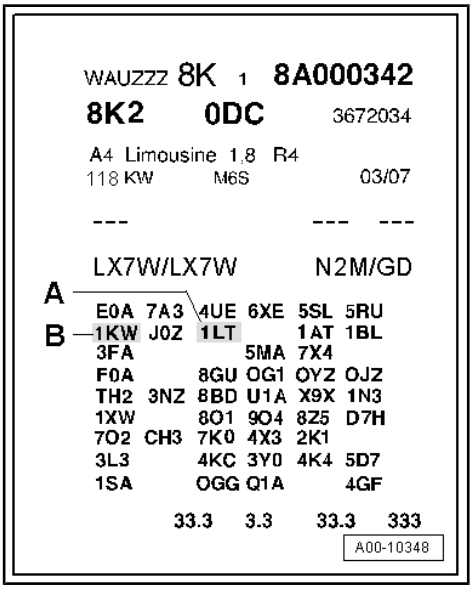
- For correct version refer to ⇒ ETKA
- The type of brake system installed in the vehicle is indicated by the corresponding PR number -A and B- on the vehicle data sticker.
- A model with type number 8K is shown in this example.



Note

- *When performing repair work on brakes, hairline cracks are often found on the friction surface of the brake discs. Hairline cracks up to a length of 10 mm do not present a technical problem and do not justify a renewal of brake discs.*
- *Brake discs and pads with cracks going all the way across the friction surface must be renewed.*

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2 Brake test

⇒ “2.1 General notes”, page 6

⇒ “2.2 Testing vehicles with front-wheel drive”, page 7

⇒ “2.3 Testing vehicles with four-wheel drive”, page 7

⇒ “2.4 Testing parking brake”, page 7

⇒ “2.5 Visible features of ceramic brake discs”, page 8

⇒ “2.6 Superficial cracks in cooling channel lands”, page 10

⇒ “2.7 Cracks in area of bolted connection on ceramic brake discs”, page 10

⇒ “2.8 Edge fractures”, page 11

⇒ “2.9 Chipping on ceramic brake discs”, page 11

⇒ “2.10 Cracks extending into cooling channels”, page 12

⇒ “2.11 Assessing degree of wear on ceramic brake discs”, page 12

⇒ “2.12 Wear assessment by checking thickness of brake disc”, page 16

⇒ “2.13 Wear assessment by checking thickness of brake disc”, page 16

⇒ “2.14 Wear assessment according to wear indicators”, page 17

⇒ “2.15 Weighing brake disc”, page 18

2.1 General notes

The wheels are driven by the brake test rollers.

During the test the gearbox must be in neutral on manual gearboxes or in position N on automatic gearboxes.

Follow the instructions provided by the manufacturer of the brake test equipment when performing the test.

Note

Electronic brake control systems are inoperative when the ignition is switched off.

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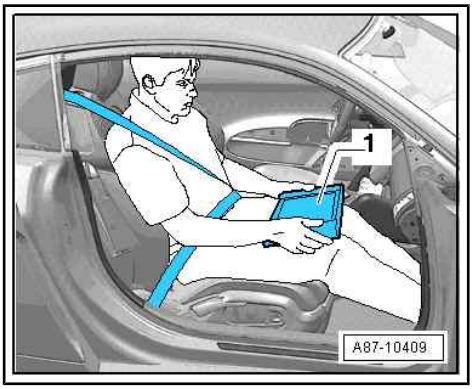
Please note the following if test and measuring equipment has to be used during a test drive:



WARNING

There is a risk of accident if the driver's attention is distracted or if the test and measuring equipment is not adequately secured during the test drive.

There is a risk of injury if the passenger's airbag is triggered during an accident.

- *The operation of test and measuring equipment during a test drive distracts the driver's attention.*
- *There is an increased risk of injury if test and measuring equipment is not secured.*

◆ *Set front passenger seat to rearmost position.*

◆ *Use only vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052- .*

◆ *The test and measuring equipment -1- must rest horizontally on the passenger's thighs as illustrated and must be operated by the passenger.*

2.2 Testing vehicles with front-wheel drive

Perform brake test on a single-axle brake dynamometer.

Test speed must not exceed 6 km/h. Otherwise the EDL control can activate the brakes if the rollers start at different points in time.

All brake test equipment approved by Audi meets these requirements.

2.3 Testing vehicles with four-wheel drive

Testing on a single-axle brake dynamometer for four-wheel drive vehicles:

The rollers drive the wheels of one axle in opposite directions to avoid transmitting torque to the other axle.

Test speed must not exceed 6 km/h. Otherwise the EDL control can activate the brakes if the rollers start at different points in time.

WARNING

The Torsen differential will be seriously damaged if test speed exceeds 6 km/h.

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All brake test equipment approved by Audi meets these requirements.

2.4 Testing parking brake

Test sequence:

– Drive rear wheels of vehicle onto test rollers.

Do not switch off the ignition.

– The “test mode” (TÜV mode) is activated as soon as the rollers reach a speed between 3 km/h and 9 km/h.

When the test mode is activated, the instrument cluster display will show “Parking brake under diagnosis”, and/or

The message “Parking brake” will flash in the instrument cluster.

The EPB will now function as follows:

The full brake force is not applied at once, but step by step each time the parking brake switch is pulled.

After operating the switch a few times the brake force attained is sufficient for the measuring procedure.

Observe the display of the brake test rollers.

The brake is released by pressing the switch once.

Requirements for “test mode”:

– Ignition on

– Front wheels, speed = 0 km/h

– Rear wheels, min. speed = 3 km/ h, max. speed = 9 km/h

When the test mode is activated, the instrument cluster display will show “Parking brake under diagnosis”, and/or

The message “Parking brake” will flash in the instrument cluster.

2.5 Visible features of ceramic brake discs

Note

Ceramic brake discs are installed on the front axle only.

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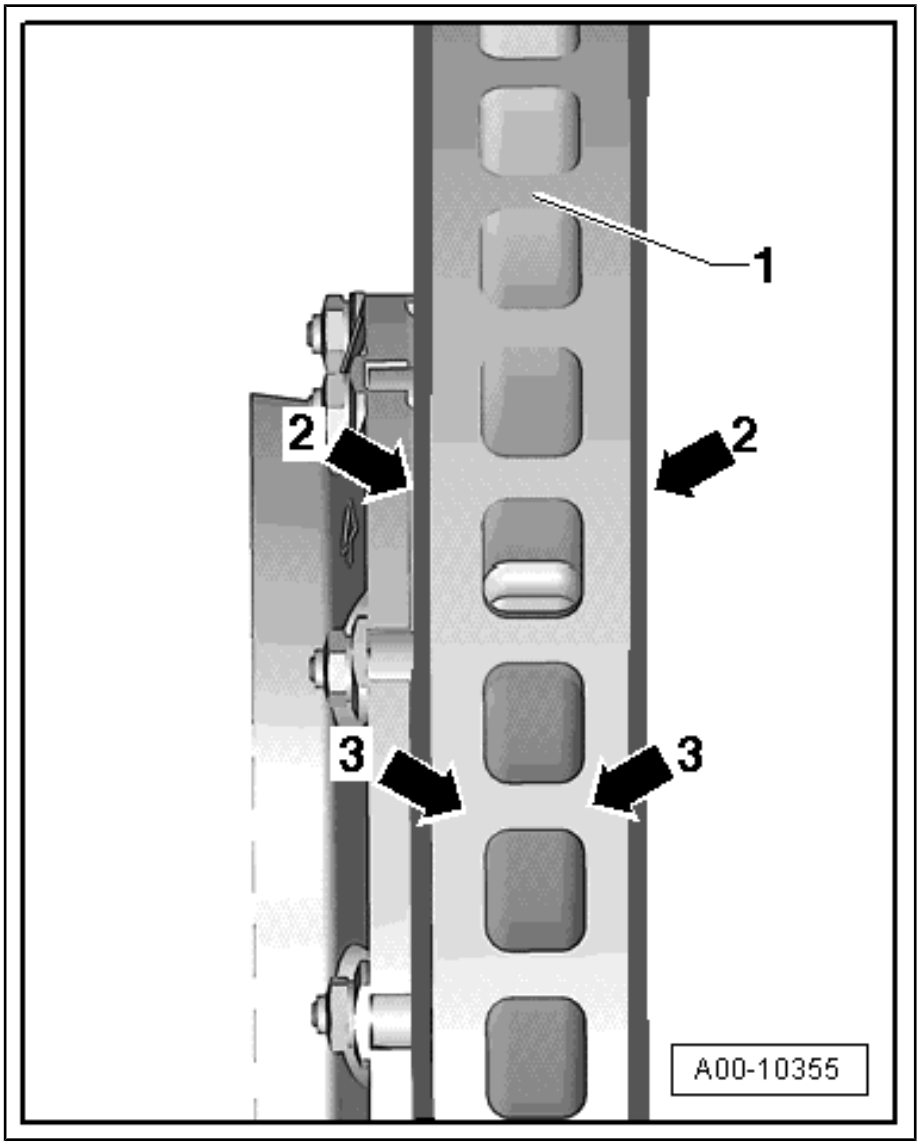
1 - Cooling channel lands

2 - Friction layer

3 - Carrier material



Checking area of bolted connection on friction ring and brake disc hub:

WARNING

The brake disc rotor and the brake disc hub are bolted together and must NOT be separated. DO NOT slacken the bolted connection on the brake disc hub.

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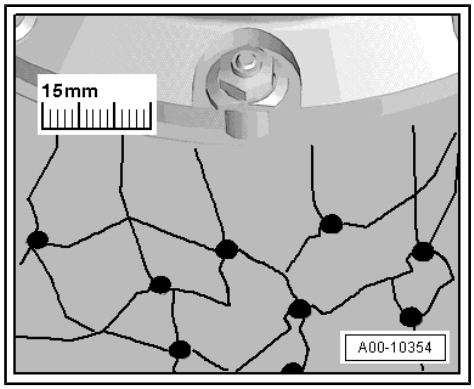
Due to the production process there already are relaxation cracks (varying degrees) on the friction surface of the brake disc when it is new.



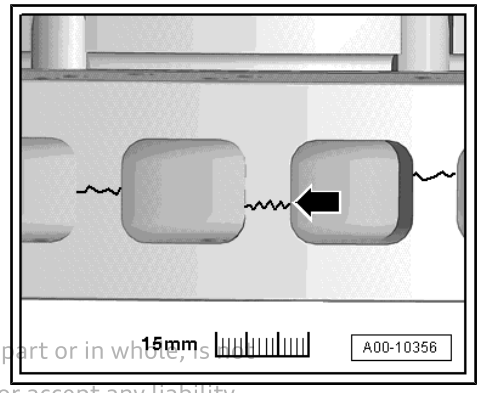
Note

Relaxation cracks on a ceramic brake disc do not constitute a technical problem.

The relaxation cracks may be clearly visible and vary in size.

2.6 Superficial cracks in cooling channel lands

Superficial cracks in the cooling channel lands -arrow- are caused during manufacturing.



Note

Superficial cracks in the cooling channel lands do not constitute a technical problem on the ceramic brake discs.

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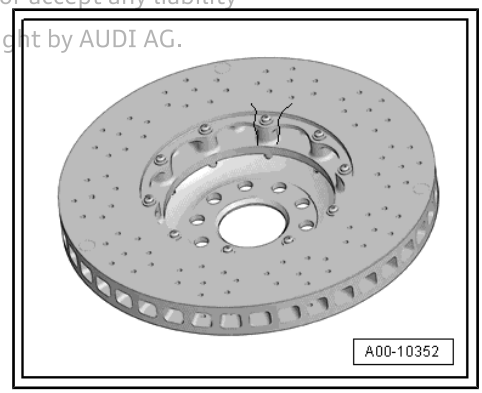
2.7 Cracks in area of bolted connection on ceramic brake discs

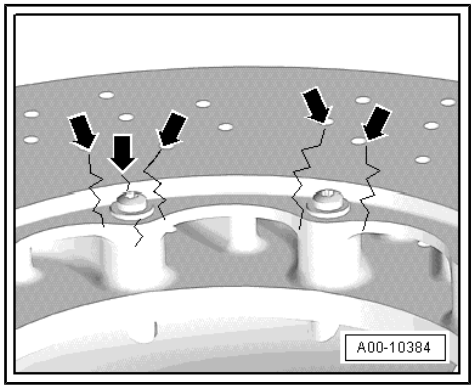
Checking area of bolted connection on friction ring and brake disc hub:

WARNING

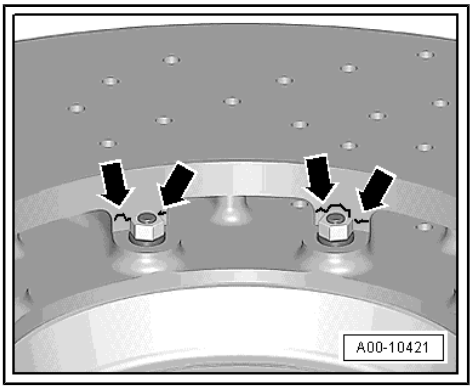
The brake disc rotor and the brake disc hub are bolted together and must NOT be separated. DO NOT slacken the bolted connection on the brake disc hub.



Ceramic brake discs must be renewed if there are cracks in the area of the bolted connection of the brake disc hub extending into the friction surface of the brake disc -arrows-.



Further unacceptable cracks in area of bolted connection



> **WARNING**
>
> ***If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.***

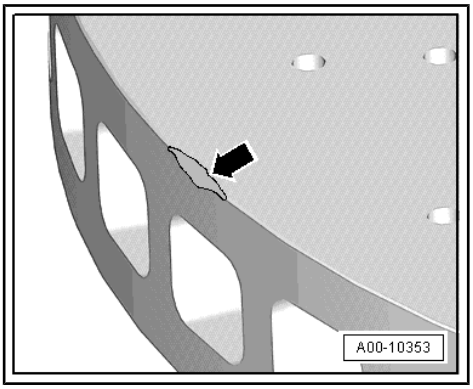
2.8 Edge fractures

Edge fractures -arrow- are caused by mechanical damage to the edges.

Permissible:

- max. width/depth = 2 mm
- max. length = 10 mm
- max. 3 edge fractures per brake disc

If any of the criteria listed above are exceeded, the brake disc must be renewed.



> **WARNING**
>
> ***If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.***

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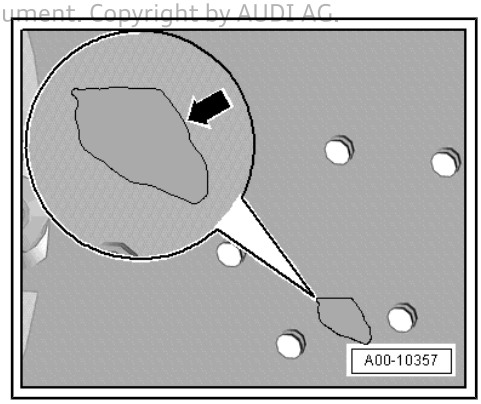
2.9 Chipping on ceramic brake discs

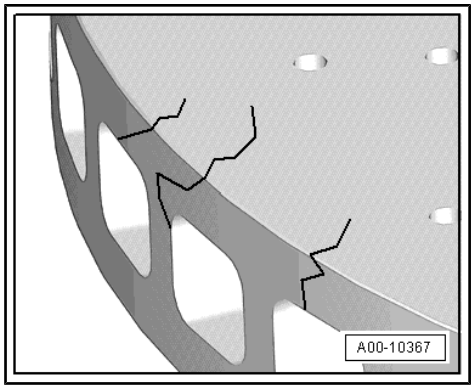
Always renew ceramic brake discs if there is chipping (larger than 1 cm^2 -arrow-) on the friction surface.



> **WARNING**
>
> ***If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.***

2.10 Cracks extending into cooling channels

Always renew ceramic brake discs if there is a crack extending from the friction surface of the brake disc to the cooling channel or through the cooling channel -arrow-.



2.11 Assessing degree of wear on ceramic brake discs

Note

- *Assessing degree of wear on latest-generation ceramic brake discs*
- *⇒ "2.16 Wear assessment of ceramic brake disc with tester VAS 6813 ", page 19*
-

Checking area of bolted connection on friction ring and brake disc hub:

WARNING

The brake disc rotor and the brake disc hub are bolted together and must NOT be separated. DO NOT slacken the bolted connection on the brake disc hub.

Designation of ceramic brake disc on brake disc hub

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1 - Direction of rotation

2 - Supplier

3 - Serial production number of brake disc

4 - Audi part number

Note

The Audi part number of the brake disc is an example and can vary depending on the vehicle type and model

5 - Production date of brake disc

6 - Permissible minimum thickness of brake disc

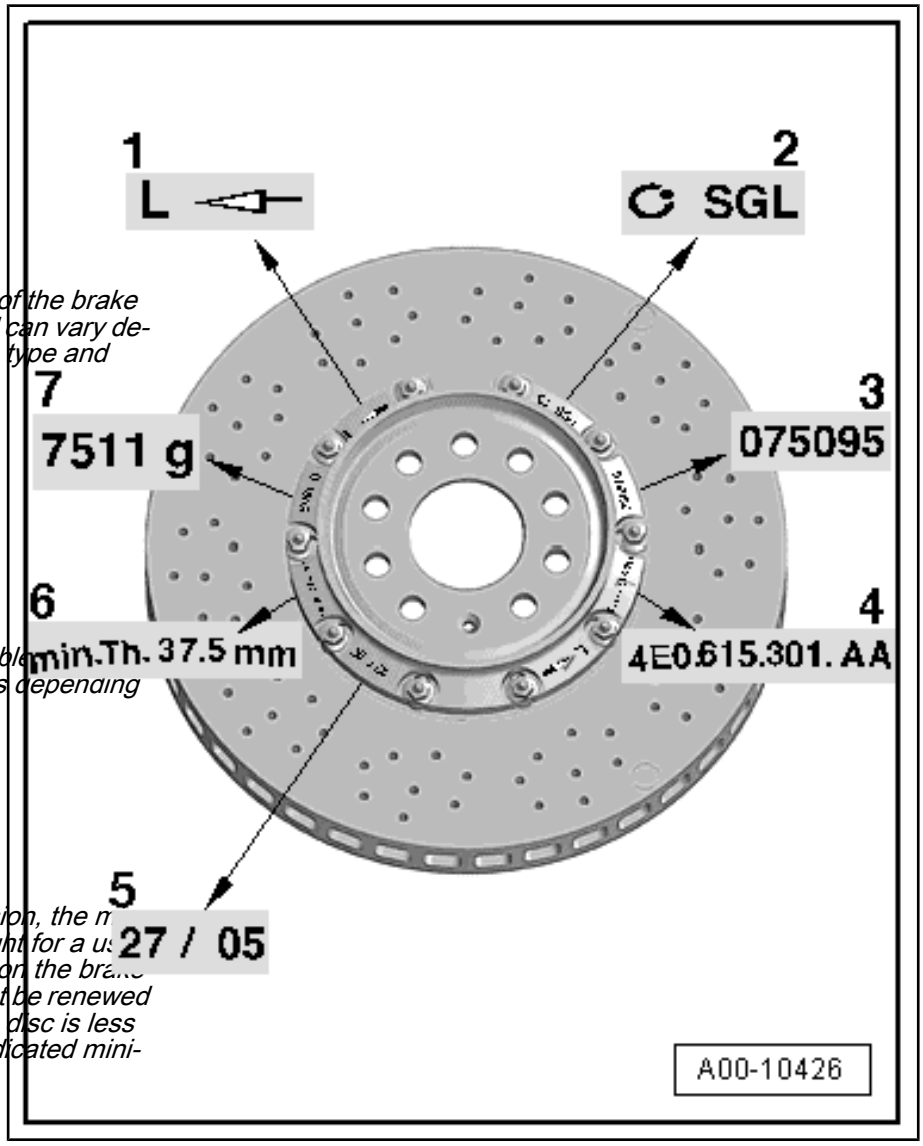
Note

The minimum permissible of the brake disc differs depending on the type of vehicle.

7 - Weight of new brake disc with brake disc hub

Note

Depending on the version, the m imum permissible weight for a us brake disc is stamped on the bra disc hub. The disc must be renewed when the weight of the disc is less than or equal to the indicated minimum weight.



Caution

If the minimum permissible weight of the disc is indicated on the hub of the disc ("min. weight"), the disc must be additionally weighed to assess the amount of wear.

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

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Checking area of bolted connection on friction ring and brake disc hub:

WARNING

The brake disc rotor and the brake disc hub are bolted together and must NOT be separated. DO NOT slacken the bolted connection on the brake disc hub.

The brake disc must first be cleaned before assessing the degree of wear as described below.

WARNING

DO NOT clean the brake disc with water or other fluids. Otherwise false results will be obtained.

Caution

Always observe respiratory protection requirements when cleaning brake discs or other parts of the brake system using compressed air.

Note

- *The brake disc ventilation drillings must be completely free of brake dust and dirt. Clear out carefully with a suitable tool if necessary. Do not use force.*
- *Thoroughly blow out the brake discs with compressed air (including the area between the cooling channels and ventilation drillings).*

Caution

Always observe respiratory protection requirements when cleaning brake discs or other parts of the brake system using compressed air.

To assess the brake disc wear, proceed as follows:

- 1. Wear assessment by checking thickness of brake disc
- 2. Wear assessment according to wear indicators

1. Wear assessment by checking thickness of brake disc ⇒ page 16	
Thickness of brake discs in permissible range → brake disc OK	
Brake disc thickness in critical range min. Th + 0.2 mm	Value at or below limit
↓↓	↓↓
Further wear assessment according to wear indicators	Renew brake disc

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↓ ↓	----------
2. Wear assessment according to wear indicators ⇒ page 17	
None of the six wear indicators fully worn out → brake disc OK	
----------	One of the six wear indicators fully worn out
---------	↓ ↓
----------	Renew brake disc

Note

- *Depending on the version, the minimum permissible weight for a used brake disc is stamped on the brake disc hub. The disc must be renewed when the weight of the disc is less than or equal to the indicated minimum weight.*
- *Proceed as follows:*

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Caution

If the minimum permissible weight of the disc is indicated on the hub of the disc ("min. weight"), the disc must be additionally weighed to assess the amount of wear. The disc must be renewed when the weight of the disc is less than or equal to the indicated minimum weight.

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

Brake disc with minimum weight stamped on hub:

- 1. Wear assessment by checking thickness of brake disc
- 2. Wear assessment according to wear indicators
- 3. Wear assessment by weighing

1. Wear assessment by checking thickness of brake disc (if minimum weight is stamped on hub) ⇒ page 16	
Thickness of brake discs in permissible range → brake disc OK	
Brake disc thickness in critical range min. Th + 0.05 mm	Value at or below limit
↓ ↓	↓ ↓
Further wear assessment according to wear indicators	Renew brake disc
↓ ↓	----------
2. Wear assessment according to wear indicators ⇒ page 17	
None of the six wear indicators fully worn out → brake disc OK	
----------	One of the six wear indicators fully worn out
	↓ ↓
	3. Weighing brake disc ⇒ page 18

		Minimum weight not yet reached; brake disc OK
		Minimum weight reached
---		↓↓
---		Renew brake disc

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

2.12 Wear assessment by checking thickness of brake disc

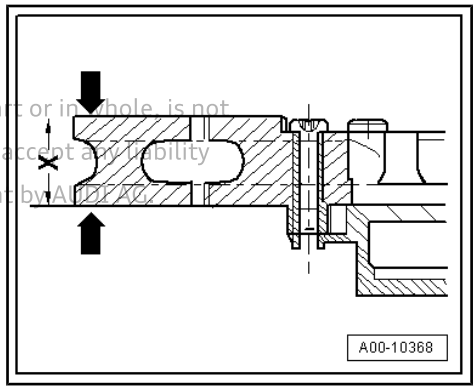
If the minimum permitted weight of the brake disc is stamped onto the hub of the disc, proceed as described on ⇒ page 16

Special tools and workshop equipment required

- Use a commercially available caliper gauge or micrometer gauge.

The minimum permissible thickness of the brake disc is engraved as “min. Th.” on the brake disc hub.

– Measure the thickness of the brake disc next to each wear indicator all around the brake disc (three times). -x-



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Note

If the thickness is down to “x = min. Th. + 0.20 mm”, additionally check the wear of the disc by inspecting the wear indicators.

If the thickness of the brake disc is less than or equal to the minimum permissible thickness “min. Th.”, do NOT continue using the brake disc. The brake disc must be renewed.

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

2.13 Wear assessment by checking thickness of brake disc

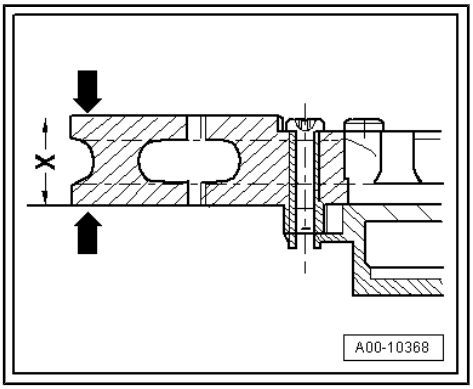
When minimum weight is stamped on hub of brake disc

Special tools and workshop equipment required

- Use a commercially available caliper gauge or micrometer gauge.

The minimum permissible thickness of the brake disc is engraved as “min. Th.” on the brake disc hub.

– Measure the thickness of the brake disc next to each wear indicator all around the brake disc (three times). -x-



Note

If the thickness is down to "x = min. Th. + 0.05 mm", additionally check the wear of the disc by inspecting the wear indicators.

If the thickness of the brake disc is less than or equal to the minimum permissible thickness "min. Th.", do NOT continue using the brake disc. The brake disc must be renewed.

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

2.14 Wear assessment according to wear indicators

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Wear indicators are positioned at intervals of 120 degrees on the friction surfaces of the brake disc.

The wear indicators -arrow- appear in a different colour.

There are three indicators on each side of the brake disc (outside and inside).

The following illustration shows a wear indicator on a disc that has not reached the wear limit.

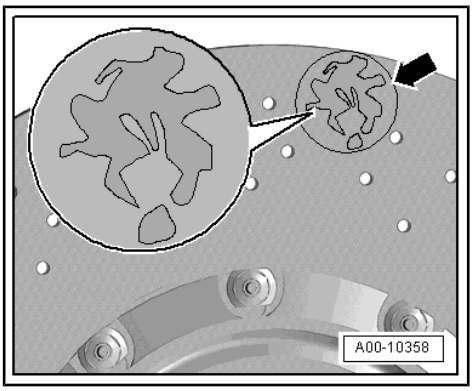

Illustration: Wear indicator – brake disc OK

The wear on the ceramic brake disc appears as a dark, burnt out recess at the wear indicator.

Do NOT continue using the brake disc if one of the six indicators is completely burnt out. The brake disc must be renewed.

The following two illustrations show brake discs on which the wear indicators are burnt out. In this case the brake disc must be renewed.

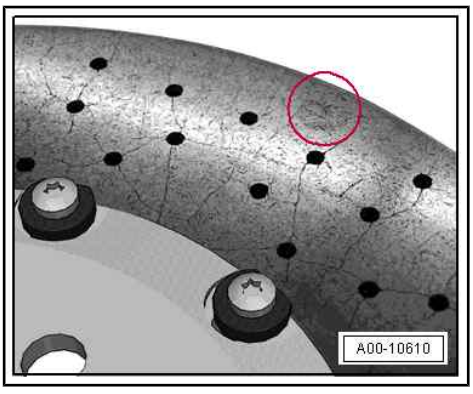

Illustration: Wear indicator burnt out

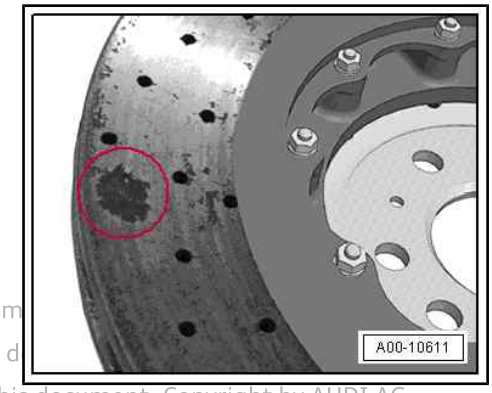

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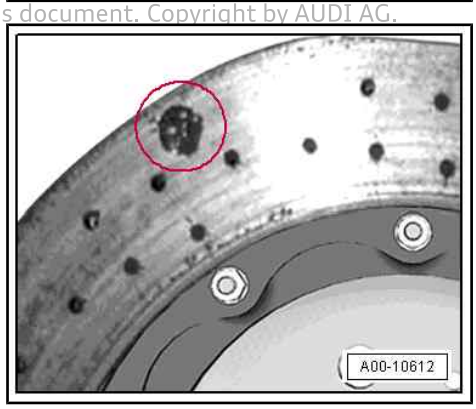
Illustration: Wear indicator burnt out



Checking area of bolted connection on friction ring and brake disc hub:

> **WARNING**
>
> ***If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.***

> **WARNING**
>
> ***The brake disc rotor and the brake disc hub are bolted together and must NOT be separated. DO NOT slacken the bolted connection on the brake disc hub.***

2.15 Weighing brake disc

Special tools and workshop equipment required

- Commercially available scales with a tolerance of ± 1 g

The brake disc must be removed for weighing ⇒ page 103 .

Note

Depending on the version, the minimum permissible weight for a used brake disc is stamped on the brake disc hub. The disc must be renewed when the weight of the disc is less than or equal to the indicated minimum weight.

Use commercially available scales to weigh the brake disc.

> **WARNING**
>
> ***DO NOT clean the brake disc with water or other fluids. Otherwise false results will be obtained.***

Note

- *The brake disc ventilation drillings must be completely free of brake dust and dirt. Clear out carefully with a suitable tool if necessary. Do not use force.*
- *Thoroughly blow out the brake discs with compressed air (including the area between the cooling channels and ventilation drillings).*

Caution

Always observe respiratory protection requirements when cleaning brake discs or other parts of the brake system using compressed air.

– Remove brake disc ⇒ page 103 .

– Weigh brake disc.

Use commercially available scales to weigh the brake disc.

The disc must be renewed when the weight of the disc is less than or equal to the indicated minimum weight.

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

2.16 Wear assessment of ceramic brake disc with tester - VAS 6813-

Note

- *The following applies for wear assessment with the tester - VAS 6813- :*
- *This is a new method for measuring the wear limit of ceramic brake discs.*
- *The wear indicators on the brake disc are no longer visible.*
- *The brake does not have to be weighed.*

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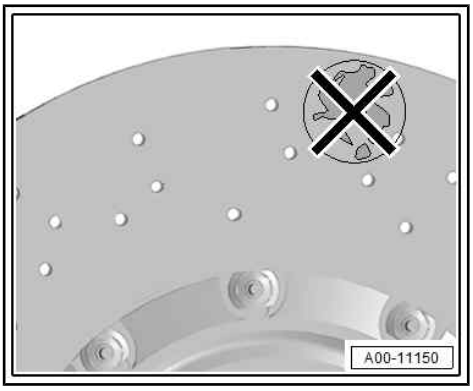
You can identify the brake disc as follows:



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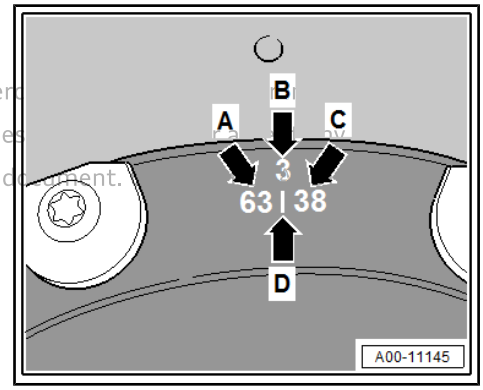
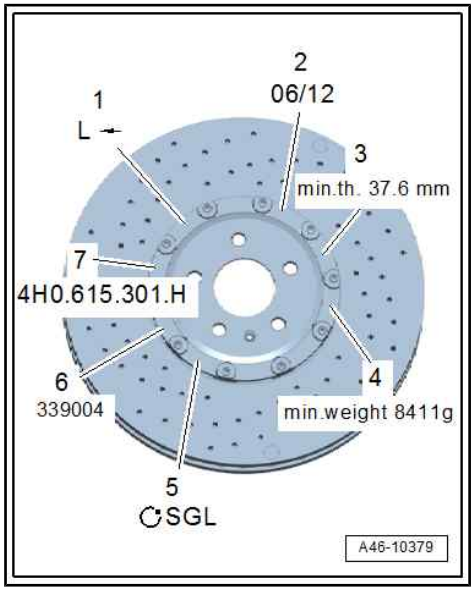
- The wear indicators -arrow- on the friction surface of the brake disc are no longer visible
- By looking at the laser-etched markings -A to D-



Note

- *The degree of wear is determined by measuring the brake disc thickness AND the wear value using the tester - VAS 6813- ; both values must be measured three times each.*
- *The minimum permissible thickness of the brake disc is engraved as “min.th.” on the brake disc hub.*
- *The wear value -C- of the brake disc for the tester - VAS 6813- is engraved on the brake disc hub.*
- *Value -A- is a value from the production of the new brake disc.*
- *Values -A and C- may vary depending on the measuring point.*
- *Values -A and C- may vary depending on the brake disc.*

Example of minimum brake disc thickness (min.th. -3-); the brake disc thickness must not be less than this value.



Note

Value -3- may vary depending on the brake disc.

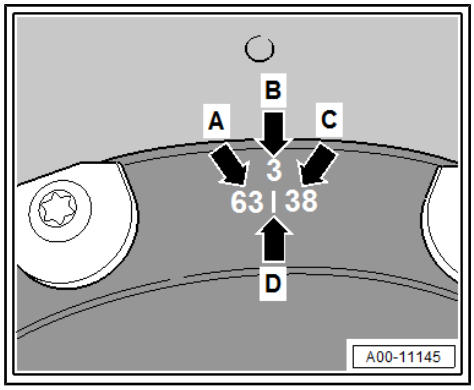
2.16.1 Checking brake disc thickness

The markings for measuring the degree of wear are spaced at intervals of 120°.

Measure the brake disc thickness at these three points.

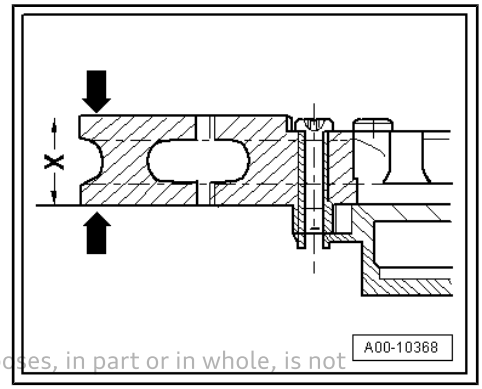
Example shows third measuring point

The minimum permissible thickness of the brake disc is engraved as “min.th.” on the brake disc hub.



– Measure the thickness -x- of the brake disc at the measuring points all around the brake disc (three times).

If the thickness of the brake disc is below the “min.th.” value at one of the measuring points, the brake disc must be renewed.



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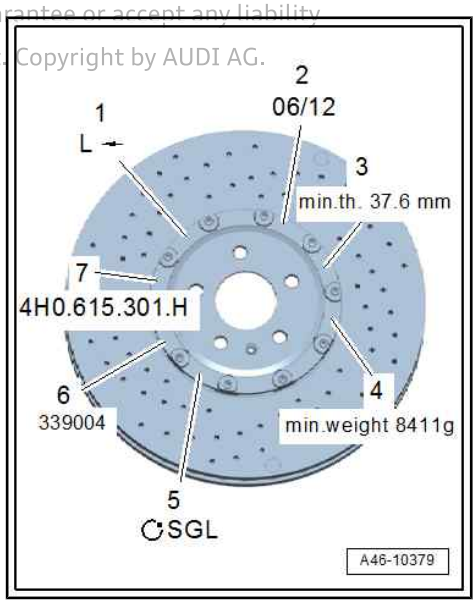
Example of minimum brake disc thickness (min.th. -3-); the brake disc thickness must not be less than this value.



Note

Value -3- may vary depending on the brake disc.

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

If the thickness of the brake disc is not below the minimum value, proceed to
⇒ “2.16.3 Wear assessment with tester VAS 6813 ”, page 22 .

2.16.2 Checking tester - VAS 6813-

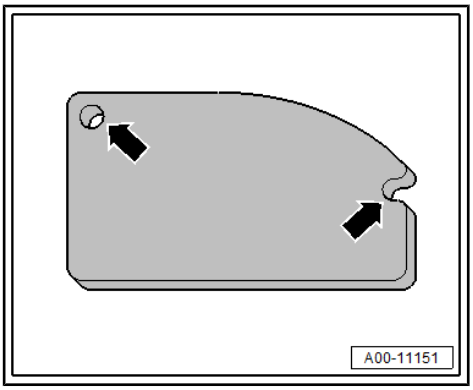
Before taking measurements, the tester - VAS 6813- must be checked using the measuring plate provided.

Measuring plate:

– Place tester in both openings -arrows- of measuring plate so that laser beam points downwards towards marking with affixed reference value.

– Switch on tester.

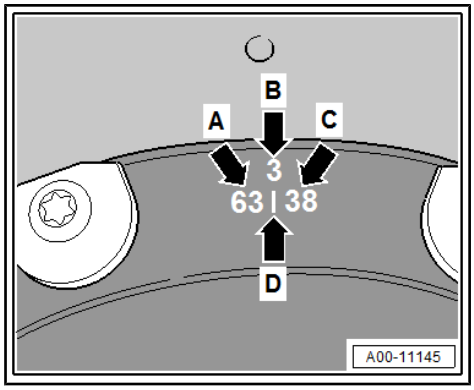
The value now shown must correspond to the reference value affixed to the measuring plate.



Note

- *If the value shown differs from the reference value by more than ± 2.0 units, the tester must be re-calibrated by the supplier.*
- *Please refer to the enclosed instructions for further information.*

2.16.3 Wear assessment with tester - VAS 6813-



Note

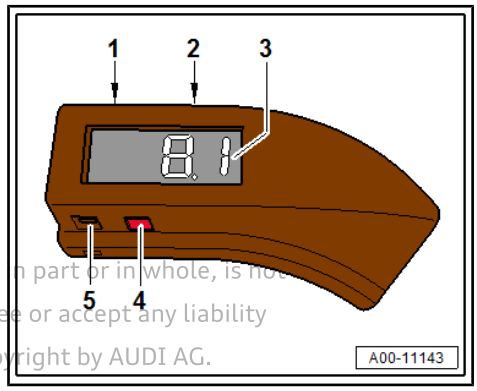
- *The degree of wear is determined by measuring the brake disc thickness AND the wear value using the tester - VAS 6813- ; both values must be measured three times each.*
- *The wear value -C- for the tester - VAS 6813- is engraved on the brake disc hub.*
- *Values -A and C- may vary depending on the measuring point.*
- *Values -A and C- may vary depending on the brake disc.*
- *Value -A- is a value from the production of the new brake disc.*

- Wheel has been removed.
- Brake disc thickness has been checked.
- Tester has been checked
⇒ “2.16.2 Checking tester VAS 6813 ”, page 21 .

Special tools and workshop equipment required

- Tester - VAS 6813-

Tester - VAS 6813- :



- 1 ON/OFF switch
- 2 Button for taking measurement
- 3 Display for measurement
- 4 Laser beam for positioning
- 5 Interface

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Note

Please refer to the enclosed instructions for further information about the tester - VAS 6813- .

Measurement:

- The brake disc must be clean.
- The brake disc must be dry.

WARNING

Risk to health

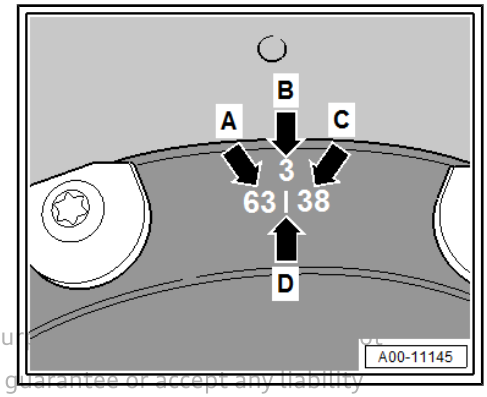
- *Always observe respiratory protection requirements when cleaning ceramic brake discs using compressed air.*
- *DO NOT clean the brake disc with water or other fluids.*

The markings for measuring the degree of wear are spaced at intervals of 120°.

The measuring procedure described below must be performed at all three measuring points to ensure that the degree of wear is determined reliably.

-A-: new value, -C-: wear value, -B-: measuring point number, -D-: marking for laser beam for measuring wear value.

The third measuring point -B- (of points 1 to 3) can be seen in the example.



Note

- *Values -A and C- vary depending on the measuring point.*
- *Values -A and C- vary depending on the brake disc.*

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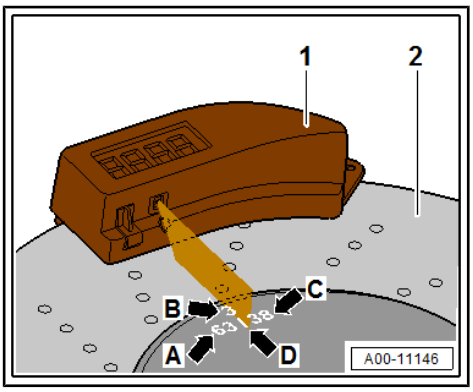
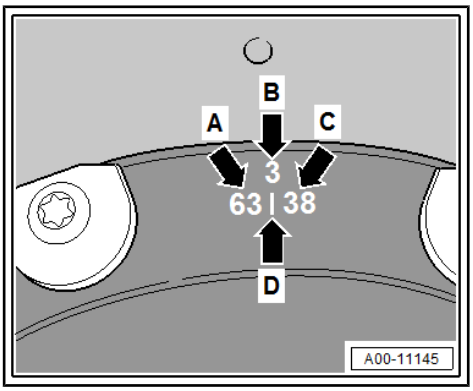
– Place tester - VAS 6813- at outer edge of brake disc so that it is flush.
– Switch on tester - VAS 6813- .



– Move tester - VAS 6813- -1- along outer edge -2- until laser beam points exactly towards marking -D- on brake disc.
– Measure wear at all three measuring points (1 to 3) on brake disc.
– To do so, read off value displayed on tester - VAS 6813- .

The brake disc must be removed and checked further for wear if the value is less than or equal to one of the three wear values -C- .



Note

Wear value -C- varies depending on the measuring point.

– Remove brake disc.

Note

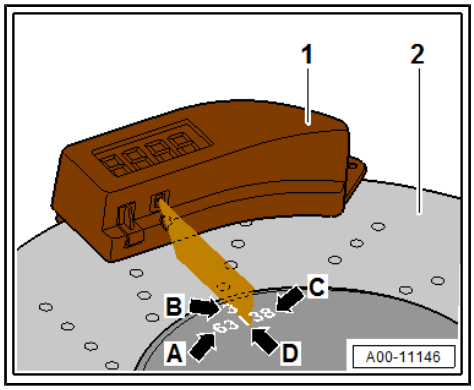
- *To ensure that the following measurement is completely accurate, place the brake disc on a non-conductive surface (e.g. wooden table).*
- *The surface must be clean and dry.*
- *The brake disc must be clean and dry.*

– Place tester - VAS 6813- at outer edge of brake disc again so that it is flush.

The measuring procedure must be performed at all three measuring points to ensure that the degree of wear is determined reliably.

– Move tester - VAS 6813- -1- along outer edge -2- until laser beam points exactly towards marking -D- on brake disc.
– Measure wear at all three measuring points (1 to 3) on brake disc.
– To do so, read off value displayed on tester - VAS 6813- .

The brake disc must be renewed if the value is less than or equal to one of the three wear values -C- .



WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

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45 – Anti-lock brake system

1 General notes

⇒ “1.1 Notes for repair work on the ABS”, page 25

⇒ “1.2 Vehicle diagnostic, testing and information system”, page 26

1.1 Notes for repair work on the ABS

WARNING

The anti-lock brake system is basically maintenance-free.

Testing, removing, installing and repair work may only be performed by qualified personnel.

Failure to observe the information described in this Workshop Manual may result in damage to the system and could make the vehicle unsafe.

- Before carrying out repair work on the anti-lock brake system, determine the cause of the problem using self-diagnosis.
- If a new hydraulic control unit has been fitted, you must check that it has the correct coding; use vehicle diagnosis, testing and information system - VAS 5051B- or -VAS 5052- .
- Always switch off the ignition before carrying out installation or repair work. On vehicles with a coded radio, find out the anti-theft code and disconnect the battery earth strap.
- When working with brake fluid, observe the relevant safety precautions and notes ⇒ page 248 .
- Always bleed the brake system (using brake filling and bleeding equipment - VAS 5234-) after all work which involves opening the hydraulic system. In addition, a high- and low-pressure test should be carried out on the brake system ⇒ page 255 .
- During the final road test, ensure that at least one ABS-controlled braking operation is performed (pulsations must be felt at the brake pedal). Refer to vehicle diagnosis, testing and information system - VAS 5051B- or -VAS 5052- .
- Absolute cleanliness is required when working on the anti-lock brake system; avoid any products that contain mineral oil, such as oil, grease, etc.
- Thoroughly clean all connections and the adjacent areas before loosening, but do not use aggressive cleaning agents such as brake cleaner, petrol, thinners or similar.
- After removal, place parts on a clean surface and cover them.
- Carefully cover or seal open components if repairs cannot be carried out immediately. (Use sealing plugs from repair kit 1H0 698 311 A)
- Only use lint-free cloths.
- Only remove replacement parts from packaging immediately prior to installation.
- Only use genuine parts from original packaging.

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- When the system is open, do not work with compressed air and do not move the vehicle.
- Ensure that no brake fluid enters electrical connector.

1.2 Vehicle diagnostic, testing and information system

Special tools and workshop equipment required

- Vehicle diagnosis and service information system - VAS 5051 B- or -VAS 5052-

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– Plug in connector of diagnostic cable VAS 5051/5a at diagnostic connection.
– Switch on tester.

The tester is ready as soon as a picture of a car appears in the display.

– Switch on ignition.
– Press the Guided Fault Finding button on the display screen.
– Select the following:

♦ Make
♦ Type
♦ Model year
♦ Version
♦ Engine code

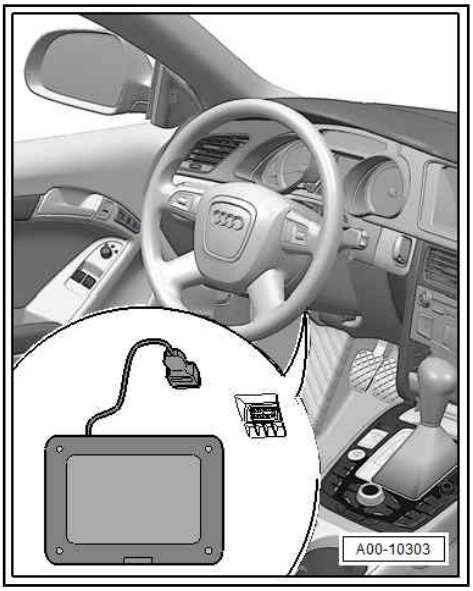
– Confirm the entered information.

Wait until the tester has interrogated all the control units in the vehicle.

– Press the Go to button and select the option “Function/component selection”.
– Select “Running gear” on the display.
– Select “Brake system” on the display.
– Select “001 - Self-diagnosis compatible systems ...” on the display.
– Select “Anti-lock brake system ...” on the display.
– Select “Function” on the display.

You will now see displayed all possible functions for the anti-lock brake system installed in the vehicle.

– Select the function you require on the display.



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2 Overview of fitting locations

⇒ “2.1 Overview of fitting locations - ABS/ESP”, page 28

2.1 Overview of fitting locations - ABS/ESP

The Bosch ESP 8.1 system includes the following features:

- ABS - anti-lock brake system
- ASR - traction control system (TCS)
- EBPD - electronic brake pressure distribution
- EDL - electronic differential lock
- ESP - electronic stabilisation program
- FBS - fading brake support
- HBA - hydraulic brake assist system
- EBC - engine braking control
- Emergency braking signal
- Pad wipe function
- Trailer stabilisation

The brake system is split diagonally. The servo-assistance is pneumatic, supplied by the vacuum brake servo unit.

Malfunctions in the ABS system do not influence the brake system and servo action. The conventional braking system remains functional even without ABS. However, the vehicle's braking behaviour can change. After the ABS warning lamp comes on, the rear wheels can lock early when braking.

The direct connection between these components reduces possible sources of faults. There is no provision for repairing the components - they must be renewed if necessary.

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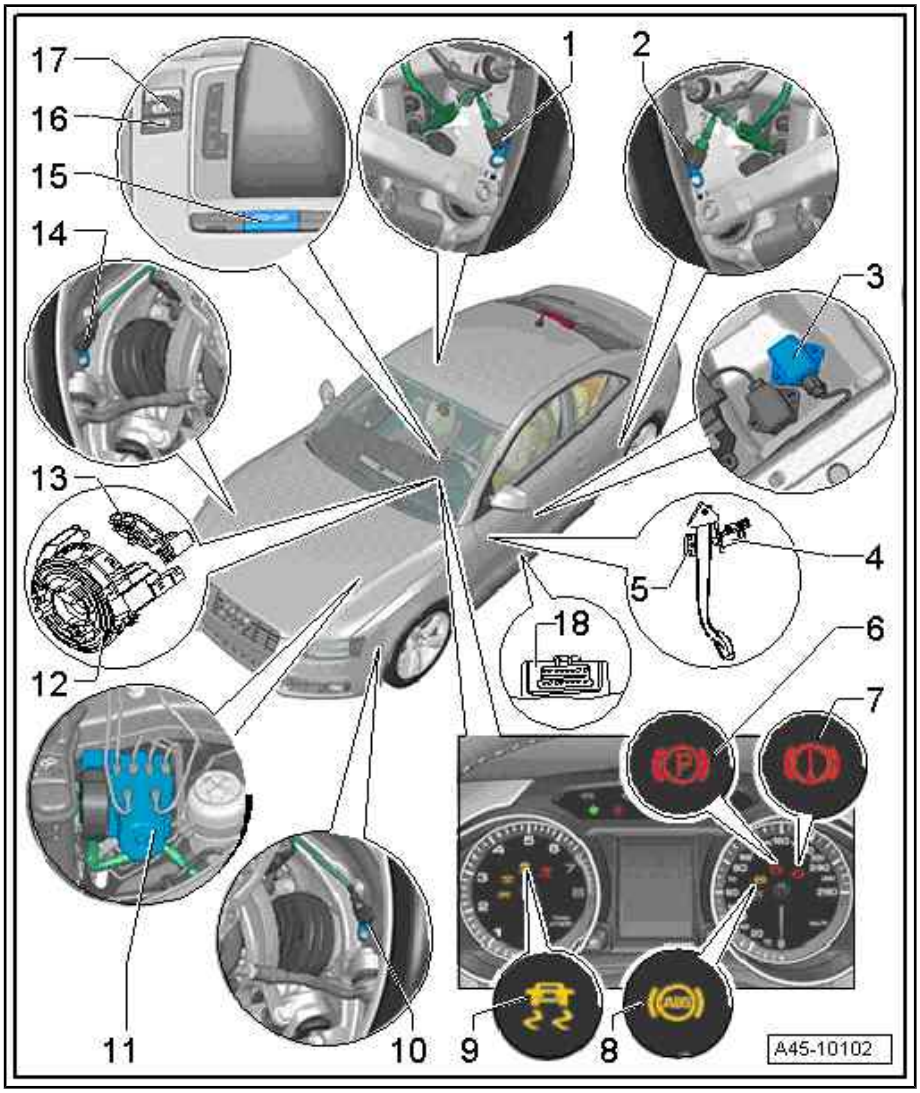
1 - Rear right speed sensor - G44-

- ❑ Removing and installing ⇒ page 40
- ❑ Can be checked in “Guided Fault Finding” using vehicle diagnostic, testing and information system - VAS 5051B- or - VAS 5052-

2 - Rear left speed sensor - G46-

3 - ESP sensor unit - -G419--

- ❑ Fitting location: under seat (left-side)
- ❑ Removing and installing ⇒ page 45
- ❑ 9 Nm
- ❑ Combined lateral acceleration sender -G200-, yaw rate sender -G202- and longitudinal acceleration sender -G251-
- ❑ Can be checked in “Guided Fault Finding” using vehicle diagnostic, testing and information system - VAS 5051B- or - VAS 5052-
- ❑ Observe installation instructions
- ❑ When installing ensure that arrow points in di-



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rection of travel

4 - Brake light sensor

- ❑ Fitting location: on brake pedal
- ❑ Removing and installing ⇒ page 40
- ❑ Can be checked in “Guided Fault Finding” using vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052-

Can be re-installed if removed

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5 - Brake pedal

- ❑ With bracket for brake light sensor
- ❑ Removing and installing; vehicles with manual gearbox ⇒ page 173
- ❑ Removing and installing; vehicles with automatic gearbox ⇒ page 175

6 - Warning lamp for electromechanical parking brake

- ❑ Fitting location: in speedometer
- ❑ Lights up when parking brake is engaged and ignition is switched on,
- ❑ Lights up for 20 seconds when parking brake is engaged and ignition is switched off,
- ❑ Flashes when parking brake has been engaged if available braking force is not sufficient to prevent vehicle from rolling away

7 - Brake system warning lamp - K118-

- ❑ Fitting location: in speedometer
- ❑ Lights up together with ABS warning lamp if ABS should fail
- ❑ Flashes if brake fluid level is too low
- ❑ Flashes if there is a fault in the brake system

Press “SET button” to display driver message with further information in instrument cluster

8 - Warning lamp for anti-lock brake system (ABS) - K47-

The warning lamp monitors the ABS and the electronic differential lock (EDL)

- ❑ Fitting location: in speedometer
- ❑ Lights up for a few seconds when the ignition is switched on and goes out after the automatic ABS self-test has been completed, providing no faults have been detected in the ABS.
- ❑ There is a malfunction of the ABS if the warning lamp:

♦ does not light up when the ignition is switched on,

♦ does not go out again after a few seconds,

♦ lights up while the vehicle is in motion.

- ❑ Malfunctions in the ABS system do not influence the brake system itself. However, a change in braking behaviour must be reckoned with.

The electronic differential lock (EDL) operates in conjunction with the ABS. The ABS warning lamp will light up if a fault occurs in the EDL.

9 - ESP/ASR warning lamp (for electronic stabilisation program and traction control system) - K155-

- ❑ Fitting location: in rev counter
- ❑ Flashes when the vehicle is in motion and the ESP/TCS control is in operation
- ❑ Lights up when the ignition is switched on and goes out after a short self-test has been completed
- ❑ Lights up if there is a malfunction in the ESP
- ❑ Lights up if there is a malfunction in the ABS, since the ESP works in conjunction with the ABS
- ❑ Lights up when the traction control system (ASR) is switched off
- ❑ Lights up during automatic self-adaption of the sensor systems when:

♦ the battery has been disconnected and then re-connected

♦ the vehicle has been jump-started

♦ the battery charge level is very low

❑ The ESP warning lamp goes out after the vehicle has been driven a short distance as soon as the automatic self-adaption of the sensor system is completed

10 - Front left speed sensor -G47-

❑ Removing and installing ⇒ page 39

❑ Can be checked in “Guided Fault Finding” using vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052-

11 - Hydraulic unit -N55- with control unit -J104-

❑ Removing and installing ⇒ page 34

12 - Return ring

❑ Removing and installing ⇒ Running gear, axles, steering; Rep. gr. 48 ; Sensors; Removing and installing steering angle sender - G85-

13 - Steering angle sender - -G85--

❑ Fitting location: incorporated in return ring with slip ring on steering column ⇒ Running gear, axles, steering; Rep. gr. 48 ; Sensors; Removing and installing steering angle sender - G85-

❑ Removing and installing ⇒ Running gear, axles, steering; Rep. gr. 48 ; Sensors; Removing and installing steering angle sender - G85-

❑ Performing zero compensation

Vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052-

14 - Front right speed sensor -G45-

15 - TCS and ESP button - E256-

❑ Fitting location: in centre console

❑ Switches traction control system (ASR) off and on

16 - Switch for Audi hold assist

❑ Fitting location: in centre console

❑ Function ⇒ page 48

❑ Removing and installing ⇒ page 49

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17 - Switch for electromechanical parking brake -F234-

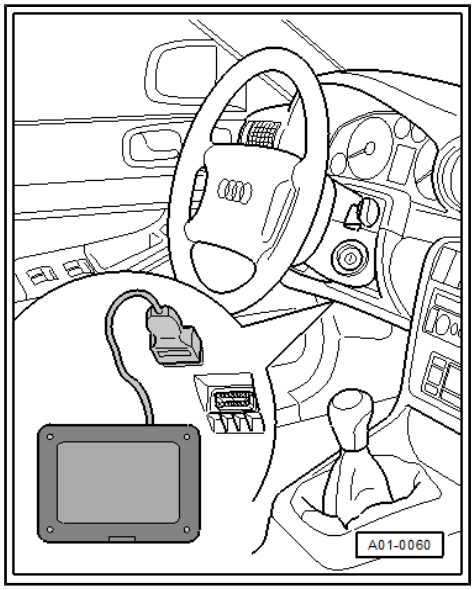
❑ Fitting location: in centre console

❑ Removing and installing ⇒ page 44

18 - Diagnostic connection

❑ Fitting location: cover in driver's footwell

Diagnostic connection



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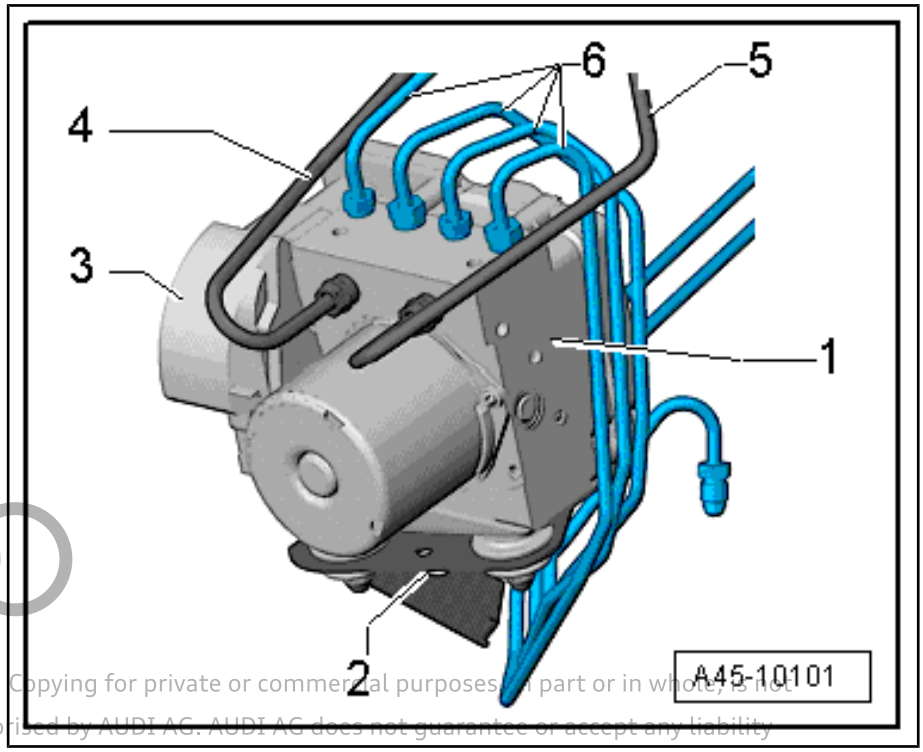
3 Control unit and hydraulic unit

⇒ "3.1 Exploded view - control unit and hydraulic unit", page 33

⇒ "3.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 ", page 34

3.1 Exploded view - control unit and hydraulic unit



1 - ABS hydraulic unit - N55- with ABS control unit - J104-

- ❑ Fitting location: In engine compartment (front left)
- ❑ Removing and installing ⇒ page 34
- ❑ Hydraulic unit -N55- with integrated brake pressure sender -G201- and control unit -J104- together form the hydraulic control unit
- ❑ These components must not be separated
- ❑ Do not unplug connector before completing self-diagnosis
- ❑ Switch off ignition before detaching connector
- ❑ Brake pressure sender -G201- is integrated in hydraulic unit -N55- and cannot be renewed separately

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Caution

ABS hydraulic unit -N55- and control unit -J104- must not be separated.

2 - Bracket for ESP

- ❑ The bracket cannot be removed

3 - Electrical connector for control unit -J104-

4 - Brake line

- ❑ To brake master cylinder
- ❑ 14 Nm

5 - Brake line

- ❑ To brake master cylinder
- ❑ 14 Nm

6 - Brake lines

- ❑ Hydraulic unit to front right brake caliper
- ❑ 14 Nm
- ❑ Hydraulic unit to front left brake caliper
- ❑ 14 Nm

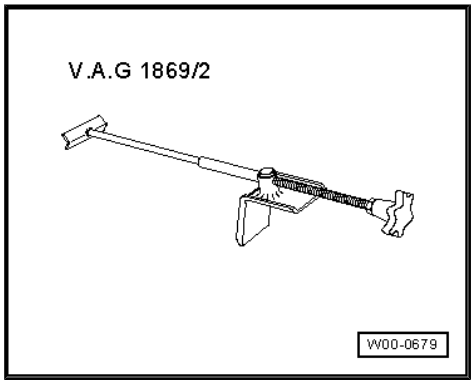
- ❑ Hydraulic unit to rear left brake caliper
- ❑ 14 Nm
- ❑ Hydraulic unit to rear right brake caliper
- ❑ 14 Nm

3.2 Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55-

Hydraulic unit -N55- with control unit -J104- is located in the engine compartment (front left).

Special tools and workshop equipment required

- ♦ Brake pedal actuator - V.A.G 1869/2-



- ♦ Sealing plugs (repair kit) - 1H0 698 311 A-

Caution

Control unit -J104- and ABS hydraulic unit -N55- must not be separated.

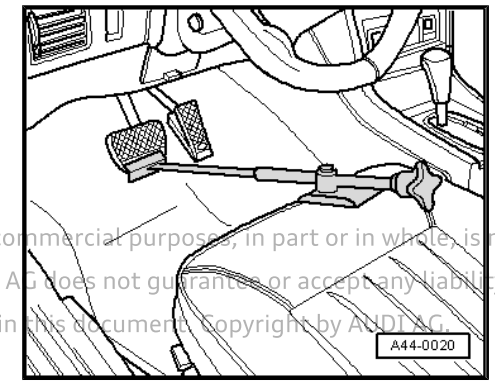
Removing

– Read out control unit version and note down.

Use vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052- .

– Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery (note radio code).

– Insert brake pedal actuator -V.A.G 1869/2- between brake pedal and driver's seat (depress brake pedal at least 60 mm). This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running dry.



– Connect hose of bleeder bottle to bleeder screw of front left brake caliper.

– Connect hose of bleeder bottle to bleeder screw of rear left brake caliper.

– Open bleeder screws of front left and rear left brake calipers to release pressure in hydraulic unit -N55-.

– Close bleeder screws (front left and rear left).

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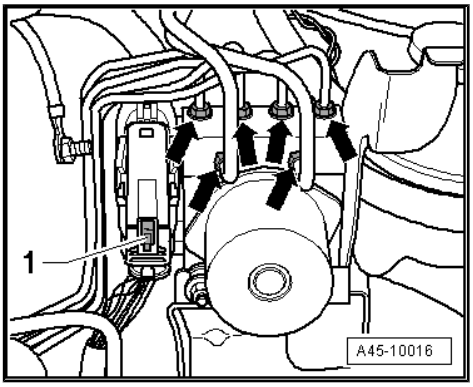
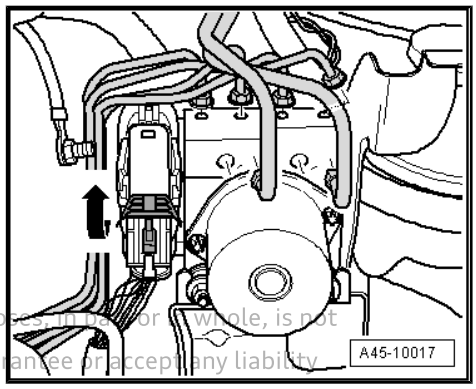
Note

Do not remove brake pedal actuator -V.A.G 1869/2- .

– Push retainer catch on electrical connector -1- for control unit upwards.



– Pull retainer clip in -direction of arrow- and unplug connector.



Note

- *Make sure brake fluid does not get into connector housing of control unit. This can result in corrosion of the contacts and failure of the system.*
- *Use compressed air to carefully clean connector housing if necessary.*

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– To protect against escaping brake fluid, place a sufficient number of lint-free cloths in area beneath control unit -J104- and hydraulic unit -N55-.

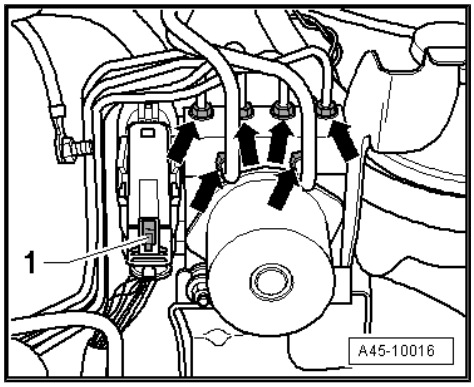
– Mark brake lines for subsequent installation.

WARNING

Do not bend or kink brake lines.

– Disconnect brake lines between hydraulic unit -N55- and brake master cylinder.

– Disconnect remaining brake lines -arrows- from hydraulic unit -N55-.
– Seal brake lines and threaded holes using sealing plugs from repair kit.
– Carefully lift hydraulic unit -N55- together with control unit -J104- out of mounting bracket.



Make sure that the rubber buffers do not drop into the engine compartment when detaching the ESP control assembly from the mounting bracket.

WARNING

Severe shocks or jolts can damage the control unit. The control unit must not be re-installed if it has been damaged in any way.

– Place hydraulic unit -N55- on a clean flat surface with control unit -J104- facing downwards.

Seal threaded holes and brake lines using sealing plugs after removing control unit -J104- and hydraulic unit -N55-.

WARNING

Hydraulic pump must not be separated from hydraulic unit -N55-.

Installing

Install in reverse sequence, paying attention to the following:

Note

- *The hydraulic unit -N55- supplied as a replacement is filled with brake fluid.*
- *Do not remove sealing plugs from new hydraulic unit -N55- until corresponding brake line is ready to be fitted.*
- *If sealing plugs are removed from hydraulic unit -N55- before fitting corresponding brake line, brake fluid will escape. Proper bleeding is then no longer ensured.*

All rubber buffers must be fitted in the mounting bracket.

– Press hydraulic unit -N55- with control unit -J104- facing downwards into mounting bracket in vehicle.

Hold the rubber buffers in place when pressing in the ESP control assembly to prevent them from dropping out.

– Connect brake lines as previously marked.

WARNING

Interchanging brake line connections will result in ABS/ESP system malfunction.

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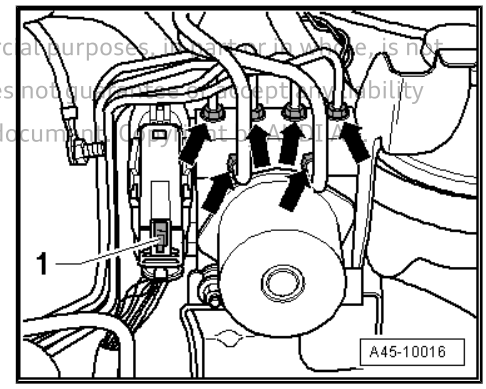
Note

Final control diagnosis can be used to establish whether line connections have been interchanged.

– Secure all brake lines -arrows- to hydraulic unit -N55-.

Component	Nm
All brake lines to hydraulic unit	14



– Attach electrical connector to control unit -J104-.

– Press down retaining clip so that it engages audibly.

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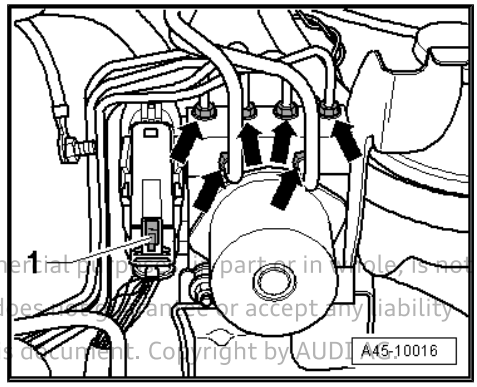
– Press down retainer catch -1- so it engages.
– Remove brake pedal actuator - V.A.G 1869/2- .
– Bleed brake system ⇒ page 248 .
– Perform final control diagnosis after securing brake lines to hydraulic unit -N55-.



Note

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Final control diagnosis can be used to establish whether line connections have been interchanged.

Use vehicle diagnosis and service information system -VAS 5051B- or -VAS 5052- to do this.

If a new control unit -J104- has been fitted, it must be encoded.

Use vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052- .

– Select on the display:
♦ Running gear
♦ Brake system
♦ 001 - Self-diagnosis compatible systems
♦ 003 - Brake electronics
– Select required function on the display:
♦ J104 Control unit for ABS/ASR/ESP
♦ J104 Control unit for ABS/ASR/ESP, functions
♦ J104 Code control unit

Also calibrate the following senders after renewing control unit -J104-.

♦ Steering angle sender -G85-
♦ Lateral acceleration sender -G200-
♦ Longitudinal acceleration sender -G251-

Use vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052- .

– Select on the display:
♦ Running gear
♦ Brake system
♦ 001 - Self-diagnosis compatible systems
♦ 003 - Brake electronics
– Select required function on the display:
♦ J104 Control unit for ABS/ASR/ESP
♦ J104 Control unit for ABS/ASR/ESP, functions.
– Then carry out ESP road test and system test.

4 Sensors

⇒ “4.1 Exploded view - front wheel speed sensor”, page 39

⇒ “4.2 Exploded view - rear wheel speed sensor”, page 40

⇒ “4.3 Removing and installing brake light sensor”, page 40

⇒ “4.4 Removing and installing parking brake contact switch”, page 44

⇒ “4.5 Removing and installing ESP sensor unit G419 ”, page 45

⇒ “4.6 Removing and installing front wheel speed sensor G45 / G47 ”, page 47

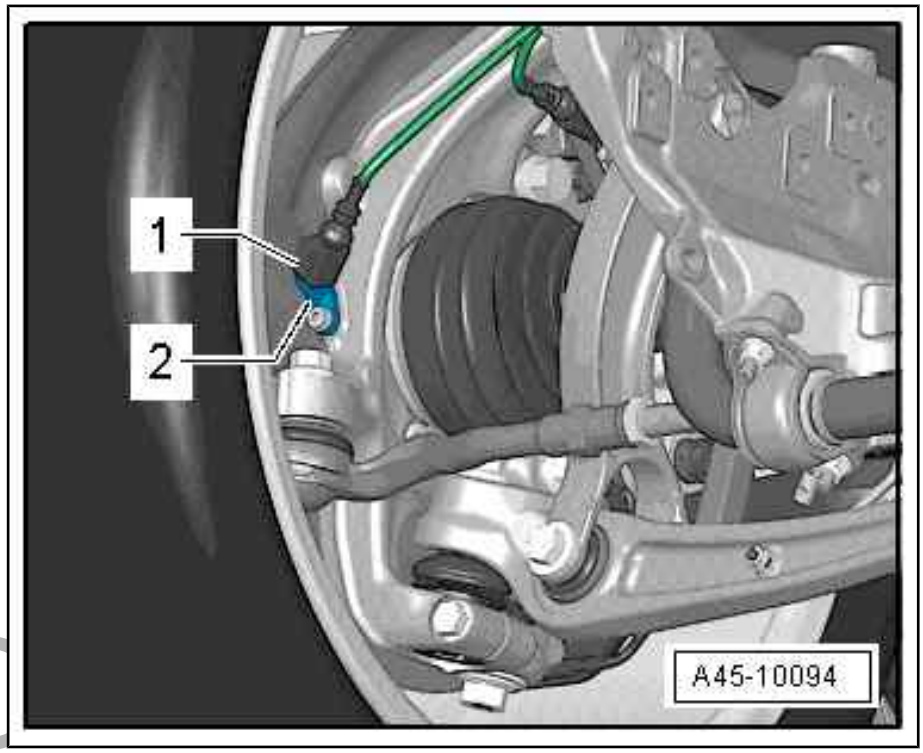
⇒ “4.7 Removing and installing rear wheel speed sensor G44 / G46 ”, page 47

4.1 Exploded view - front wheel speed sensor

Illustration shows front right of vehicle.

1 - Speed sensor -G45-/-G47-

2 - Hexagon socket-head bolt
- ❑ 9 Nm



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Note

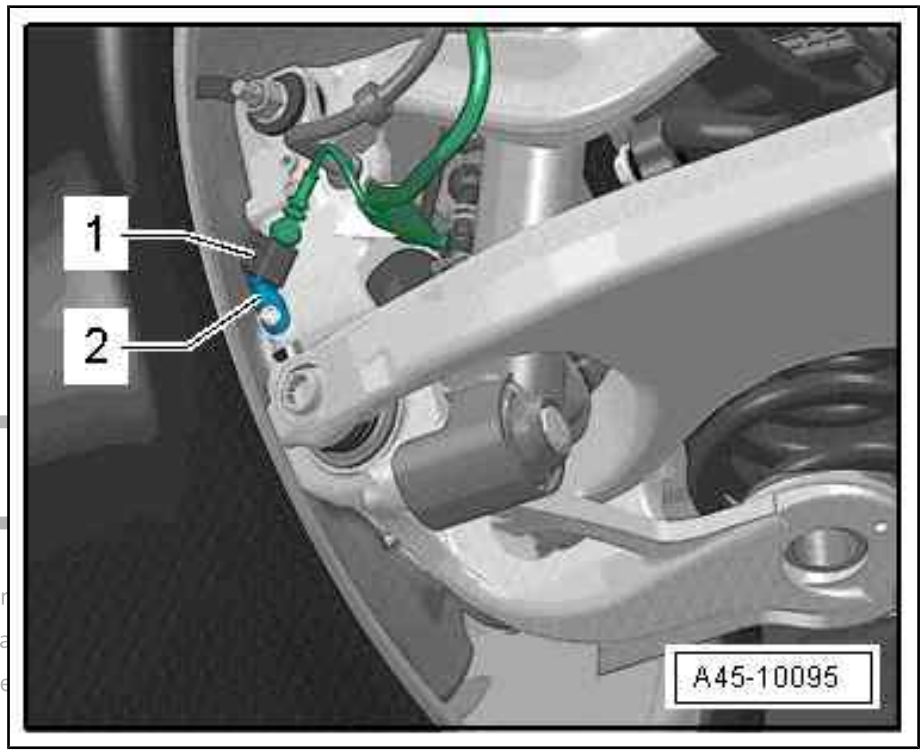
The sensor ring/rotor is incorporated in the corresponding wheel bearing unit and cannot be renewed.

4.2 Exploded view - rear wheel speed sensor

Illustration shows rear left of vehicle.

1 - Speed sensor -G44-/-G46-

2 - Hexagon socket-head bolt
- ❑ 8 Nm



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Note

The sensor ring/rotor is incorporated in the corresponding wheel bearing unit and cannot be renewed.

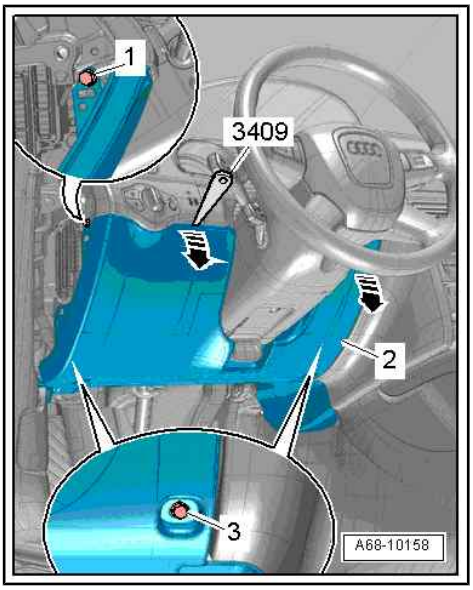
4.3 Removing and installing brake light sensor

Note

- *The brake light sensor can be re-used after it has been removed.*
- *The brake light sensor is self-adapting. Calibration is not required after installing the sensor.*

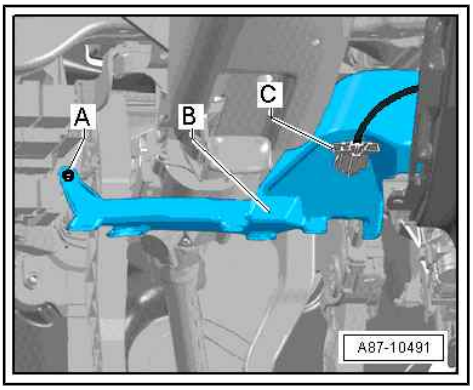
Removing

– Remove driver's storage compartment -1 ... 3-.



– Unplug electrical connector -C- for footwell vent.
– Remove footwell vent -A - B-.
– Unplug electrical connector on brake light sensor.

The stop -17- on the brake pedal is an assembly aid used in production, and does not have to be re-installed.



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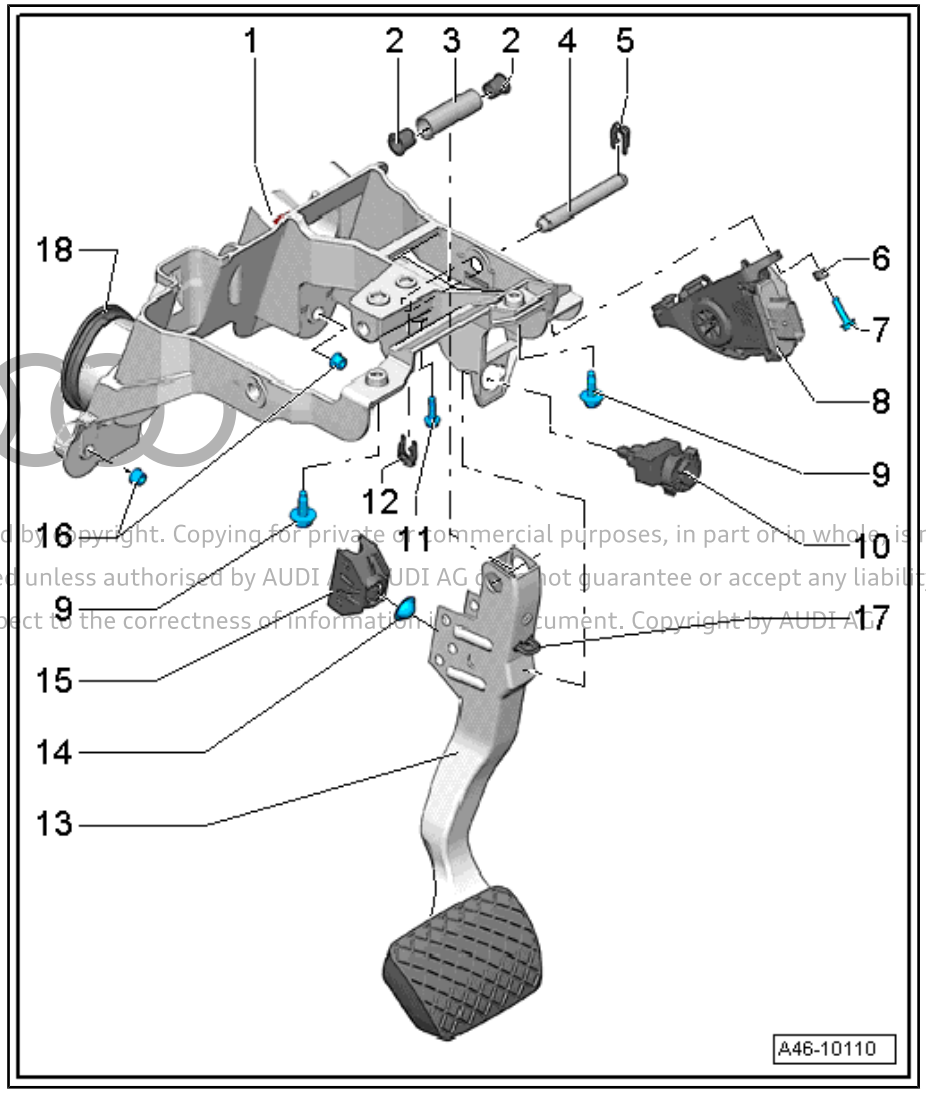

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– Press plunger of brake light sensor -10- fully in with one finger.
– With plunger still pressed in, turn coloured catch on brake light sensor fully anti-clockwise to release sensor.

Note

Keep the plunger pressed in while releasing the brake light sensor.

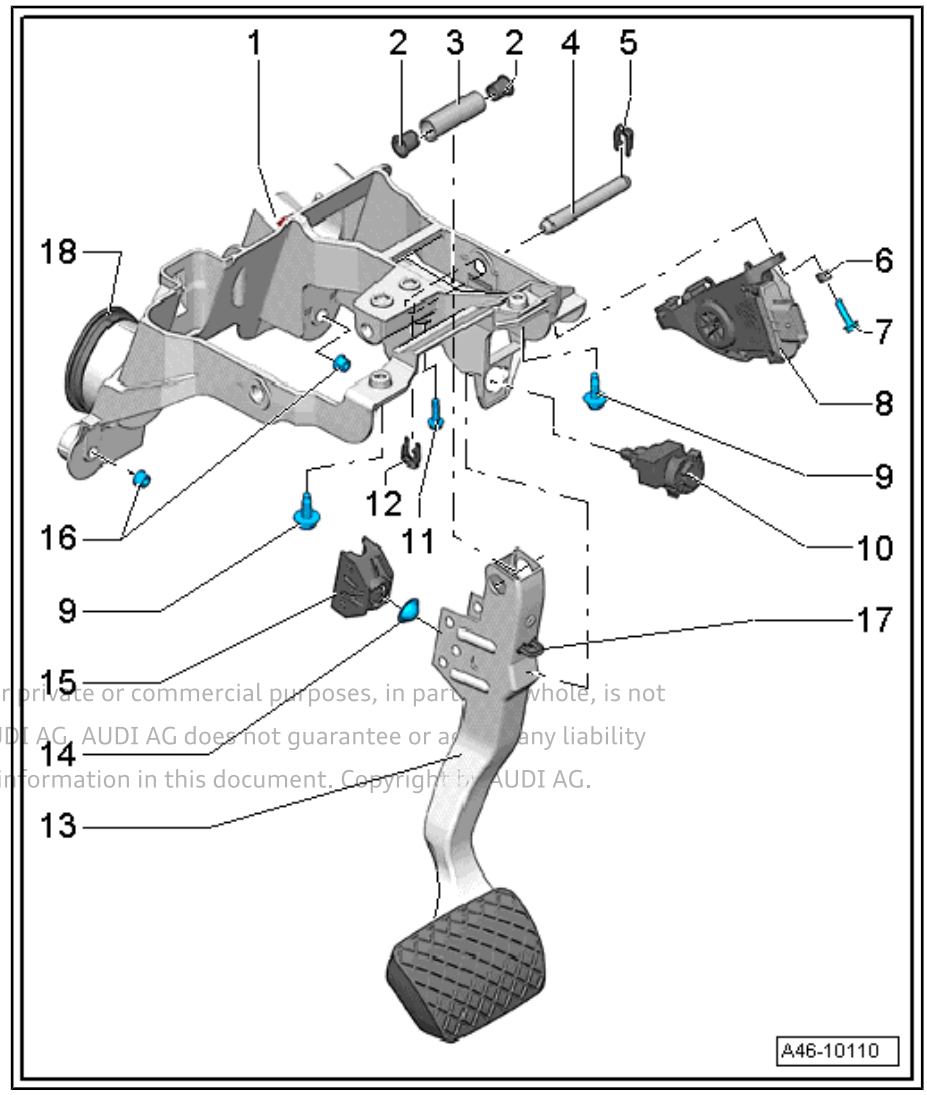
– Let go of plunger after releasing brake light sensor.
– Insert release tool - T40168- between brake pedal and plunger of brake light sensor.

The tapered part of the tool must face towards the driver's seat. The slot on the tool must correspond with the projection on the brake light sensor.

– Press release tool - T40168- against brake light sensor. This releases the three retaining tabs on the brake light sensor.
– Pull brake light sensor out of its mounting.

Installing

The stop -17- on the brake pedal is an assembly aid used in production, and does not have to be re-installed.



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Note

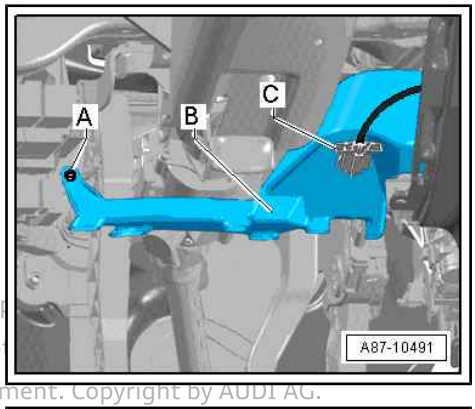
- *The plunger adjusts itself automatically when the brake light sensor is inserted.*
- *The brake pedal must remain in the normal position during installation and must not be depressed.*
- *The brake pedal must be connected to the brake servo.*

– Fit brake light sensor in mounting on brake pedal and press in lightly.

Note

- *All three retaining tabs on the brake light sensor must engage audibly.*
- *The switch must not be rotated in the mounting on the brake pedal.*
- *The plunger adjusts itself automatically when the brake light sensor is inserted.*

– Turn coloured catch on brake light sensor fully clockwise to secure sensor.
– Plug in electrical connector.
– Install footwell vent -A - B-.
– Plug in electrical connector -C- for footwell vent.



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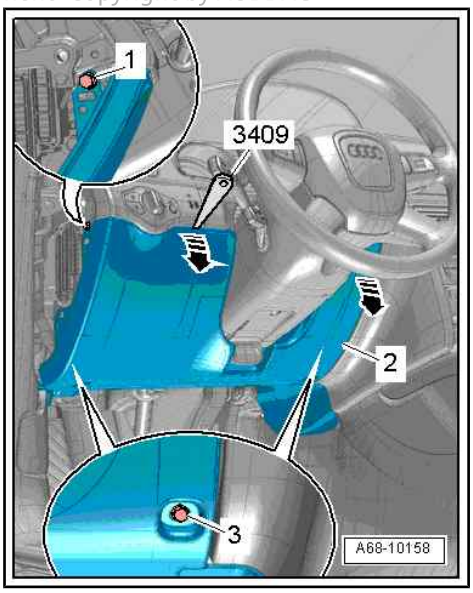
– Install driver's storage compartment -1 ... 3-.

After installing the brake light sensor, check the function of the sensor before driving the vehicle.

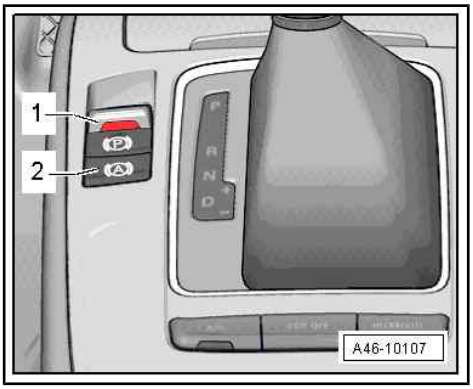


4.4 Removing and installing parking brake contact switch

Removing

– Remove centre console (MMI) ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .

– Remove parking brake contact switch - F321- -1- ⇒ Electrical system; Rep. gr. 96 ; Controls; Removing and installing electromechanical parking brake button - E538- / auto-hold button - E540- .



The switch is clipped into the front of the centre console on one side.

Installing

– Installation is carried out in reverse sequence.

4.5 Removing and installing ESP sensor unit - G419-

WARNING

The ESP sensor unit is sensitive to impact. Severe shocks or jolts can damage the ESP sensor unit. If the ESP sensor unit has been dropped by mistake it may not work properly and must not be installed in the vehicle.

The ESP sensor unit - G419- is located under the left-side seat on all vehicles.

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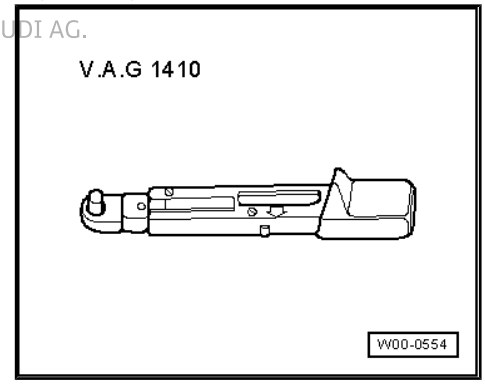
Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1410-



Removing

The ESP sensor unit - G419- is located under the left-side seat.

The arrow on the ESP sensor unit - G419- points in the direction of travel.

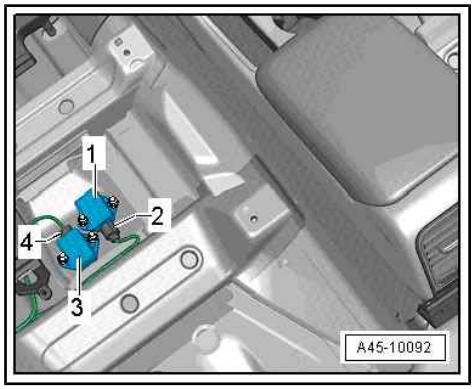
– Remove seat (left-side) ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats; Removing and installing front seat .

– Fold up seam on carpet.

Use a sharp knife to cut through the carpet seam if this has not already been done.

– Detach footwell vent.

– Unplug electrical connector -2-.
– Remove securing nuts on sensor unit.
– Lift out ESP sensor unit - G419- -1-.



Installing

Note

The arrow on the sensor unit points in the direction of travel.

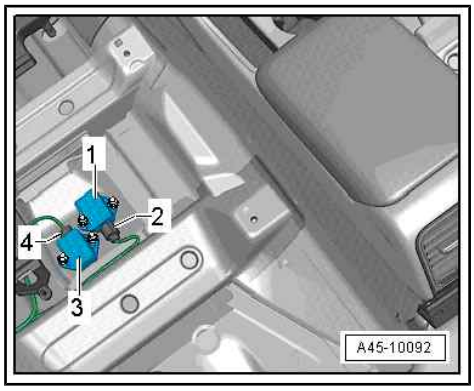
WARNING

Severe shocks or jolts can irreparably damage the ESP sensor unit - G419- .

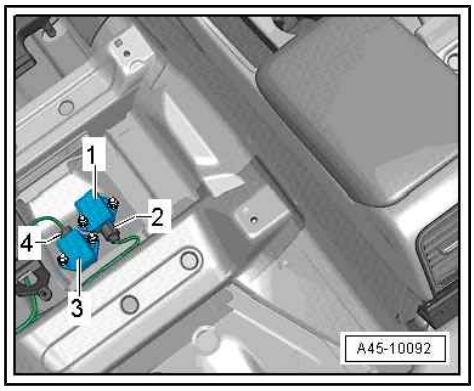
– Fit ESP sensor unit - G419- -1- into mountings from above.

When installing the ESP sensor unit - G419- , make sure it is correctly seated in its bracket and is free of stress.

– Install and tighten securing nuts on sensor unit.



– Plug in electrical connector -2-.
– Install footwell vent.
– Fold down seam on carpet.
– Install seat (left-side) ⇒ General body repairs, interior; Rep. gr. 72 ; Front seats; Removing and installing front seat .



After renewing ESP sensor unit -G419-, the following senders must be calibrated (basic setting):

- Lateral acceleration sender -G200-
- Longitudinal acceleration sender -G251-

Use vehicle diagnostic, testing and information system -VAS 5051B- or -VAS 5052- to do this.

– Select on the display:

- Running gear
- Brake system
- 001 - Self-diagnosis compatible systems
- 003 - Brake electronics

– Select required function on the display:

- Calibrate lateral acceleration sender -G200-
- Calibrate longitudinal acceleration sender -G251-

– Then carry out ESP road test and system test.

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4.6 Removing and installing front wheel speed sensor -G45- / -G47-

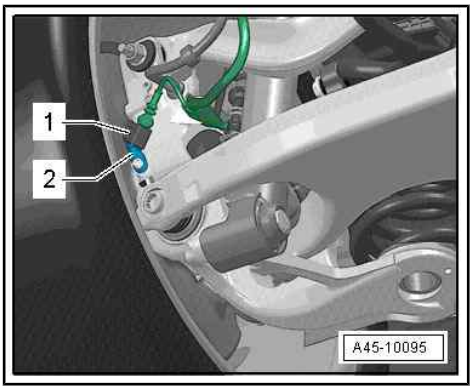
Removing

– Raise vehicle.

– Release connector -1- at speed sensor and unplug.

– Remove bolt -2-.

– Pull speed sensor out of wheel bearing housing.



Installing

Install in reverse sequence, paying attention to the following:

– Before inserting speed sensor, clean inner surface of hole and coat speed sensor thoroughly with lubricating paste G 000 650.

– After installation, turn steering to full left and right lock and check clearance of speed sensor wire.

– Lower vehicle.

4.7 Removing and installing rear wheel speed sensor -G44- / -G46-

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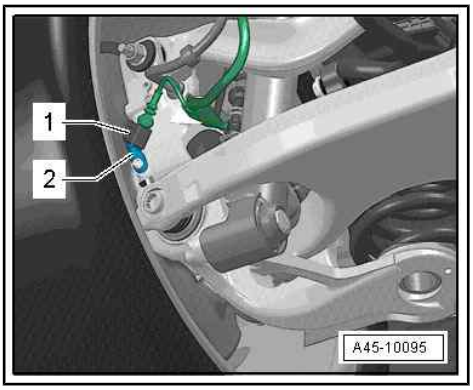
Removing

– Raise vehicle.

– Release connector -1- at speed sensor and unplug.

– Remove bolt -2-.

– Pull speed sensor out of wheel bearing housing.



Installing

Install in reverse sequence, paying attention to the following:

– Before inserting speed sensor, clean inner surface of hole and coat speed sensor thoroughly with lubricating paste G 000 650.

– Lower vehicle.

5 Auto Hold

⇒ “5.1 Description of Auto Hold function”, page 48

⇒ “5.2 Removing and installing auto-hold button”, page 49

5.1 Description of Auto Hold function

Some models are equipped with the Audi hold assist feature (AHA).

Function

This function assists the driver when the vehicle has to be held stationary, either frequently or for long periods, with the engine running.

When the Audi hold assist is activated after the vehicle comes to a standstill, it will hold the vehicle in a stationary position.

The driver can then release the brake pedal.

Initially the vehicle is held at a standstill by maintaining the brake pressure at all four wheels in the ESP system.

To prevent the ESP solenoid valves from overheating if the vehicle has to be held for long periods, the braking function is taken over automatically by the rear electromechanical parking brake if the temperature at the solenoid valves exceeds 200 °C.

The brakes are released automatically at a point determined according to the following factors:

- Engine torque
- Angle of gradient
- Gear engaged
- Manual gearbox: travel at clutch pedal detected by clutch sensor
- Automatic gearbox: torque converter slip

To prevent the vehicle from rolling back, the brakes are only released when sufficient engine torque is available.

Activation

The following requirements must be met in order to switch on the “stand-by” mode:

- Driver's seat belt fastened
- Engine running
- Driver's door closed
- No faults in ESP or electronic parking brake.

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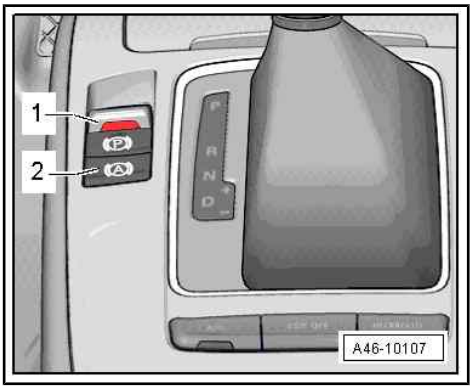
The function can then be activated by pressing the switch -2- in the centre console.



The switch indicates the status of the system:

- Deactivated: LED in switch remains off
- Stand-by: LED in switch lights up
- Active: LED in switch lights up and a green “P” appears in the instrument cluster display

The electronic parking brake only takes over the braking function from the ESP when the green “P” appears in the instrument cluster display and when:

- The ESP solenoid valves reach a temperature of 200 °C,
- The driver's door is opened,
- The driver's seat belt is unfastened,
- The engine is switched off,
- The ignition is switched off,
- The switch is operated,
- The brake pedal or accelerator pedal is pressed,
- The switch for the Audi hold assist function is operated without pressing the footbrake.

Note

The green “P” in the instrument cluster display changes to a red “P” when the electronic parking brake takes over the braking function from the ESP.

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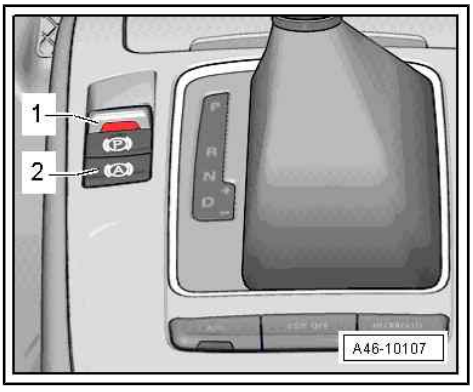
5.2 Removing and installing auto-hold button

Removing

– Remove centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Removing and installing centre console .

– Remove switch for Audi hold assist (AHA) -2- ⇒ Electrical system; Rep. gr. 96 ; Controls; Removing and installing electromechanical parking brake button - E538- / auto-hold button - E540- .



Installing

– Installation is carried out in reverse sequence.

46 – Brakes - mechanism

1 Front brakes

⇒ “1.1 Exploded view - front brakes”, page 50

⇒ “1.2 Removing and installing brake pads”, page 63

⇒ “1.3 Removing and installing brake caliper”, page 80

⇒ “1.4 Renewing brake caliper”, page 87

⇒ “1.5 Removing and installing brake disc”, page 99

⇒ “1.6 Renew brake disc”, page 105

⇒ “1.7 Removing and installing splash plate”, page 117

⇒ “1.8 Detaching and attaching damper spring”, page 122

1.1 Exploded view - front brakes

⇒ “1.1.1 Exploded view - front brake (1LT/1LY)”, page 50

⇒ “1.1.2 Exploded view - front brake (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 53

⇒ “1.1.3 Exploded view - front brake (1LM)”, page 56

⇒ “1.1.4 Exploded view - front brakes, ceramic version (1LW)”, page 59

1.1.1 Exploded view - front brake (1LT/1LY)

Note

- *Install all parts supplied in repair kit.*
- *After renewing brake pads, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.*
- *To draw off brake fluid from brake fluid reservoir use a bleeder bottle which is used only for brake fluid. Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.*

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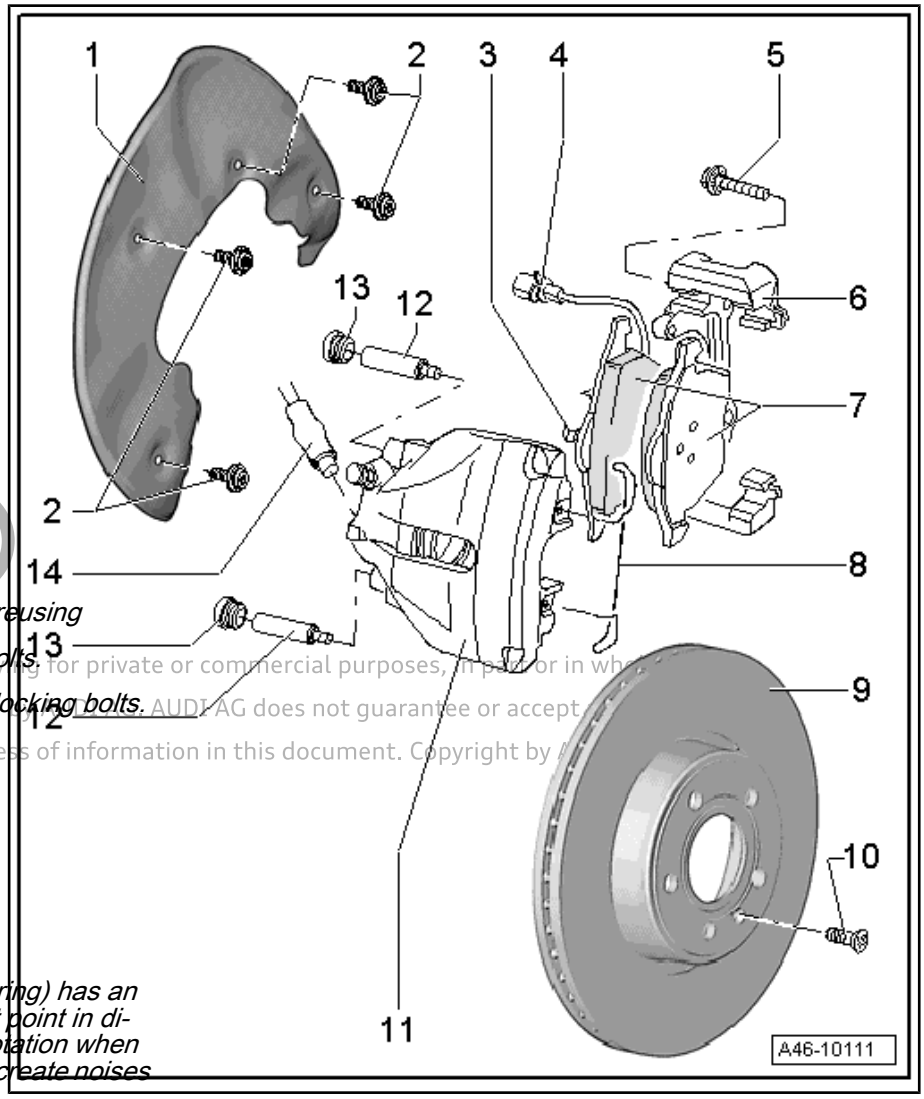
Exploded view



1 - Splash plate for brakes

- ❑ ⇒ “1.7.1 Removing and installing splash plate (1LT/1LY)”, page 117

2 - Bolt

- ❑ 18 Nm

3 - Spring

- ❑ Must be seated in brake piston

4 - Connector

- ❑ When renewing pads, remove from bracket

5 - Bolt

- ❑ 190 Nm

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

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6 - Brake carrier

- ❑ Bolt to wheel bearing housing

7 - Brake pads

Note

The inner pad (with spring) has an arrow. The arrow must point in direction of brake disc rotation when moving forwards. May create noises if incorrectly installed.

- ❑ Before inserting pads, clean guide surfaces and apply a thin coating of polycarbamide grease - G 052 142 A2- .

Note

If fitted, pull off adhesive foil on back of brake pad before installation.

- ❑ Brake pad wear indicator at front left
- ❑ Warning lamp in instrument cluster comes on when wear limit is reached
- ❑ Always renew on both sides of axle
- ❑ ⇒ “1.2.1 Removing and installing brake pads (1LT/1LY)”, page 63
- ❑ Checking pad thickness ⇒ Maintenance ; Booklet 8K
- ❑ Different versions available ⇒ ETKA

Note

Clean the brake calipers thoroughly (grease-free) before inserting new brake pads. When doing this, make sure that all adhesive foil residue on the contact surfaces for the outer brake pad is removed.

8 - Retaining spring

- ❑ Before inserting pads, clean guide surfaces and apply a thin coating of polycarbamide grease - G 052 142 A2- .
- ❑ Insert in both holes in brake caliper housing

Note

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The retaining spring must be pressed under the brake carrier after inserting into both holes. If incorrectly installed, the wear of the outer pad cannot be adjusted, and the pedal travel will be increased as a result.

9 - Brake disc

- ❑ Wear limit ⇒ page 1
- ❑ Detach brake caliper prior to removing
- ❑ ⇒ “1.5.1 Removing and installing brake disc (1LT/1LY)”, page 99
- ❑ ⇒ “1.6.1 Renewing brake disc (1LT/1LY)”, page 105

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

10 - Bolt

- ❑ 5 Nm

11 - Brake caliper housing

- ❑ Unscrew from brake carrier to renew brake pads
- ❑ ⇒ “1.3.1 Removing and installing brake caliper (1LT/1LY)”, page 80
- ❑ ⇒ “1.4.1 Renewing brake caliper (1LT/1LY)”, page 87
- ❑ ⇒ “1 Front brake caliper”, page 185

12 - Guide pin

- ❑ 30 Nm

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

13 - Trim cap

- ❑ Detach when removing guide pins
- ❑ Re-install after fitting guide pins

14 - Brake hose

- ❑ Do not disconnect brake hose when changing brake pads
- ❑ Screw into brake caliper housing
- ❑ 16 Nm at brake caliper connection

Note

Tighten bleeder screw to 13 Nm.

1.1.2 Exploded view - front brake (1LA/1LB/1LJ/1LD/1ZT and S4/S5)

Note

- *Install all parts supplied in repair kit.*
- *After renewing brake pads, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.*
- *To draw off brake fluid from brake fluid reservoir use a bleeder bottle which is used only for brake fluid. Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.*
- *Check that the brake caliper moves freely by moving it from side to side.*

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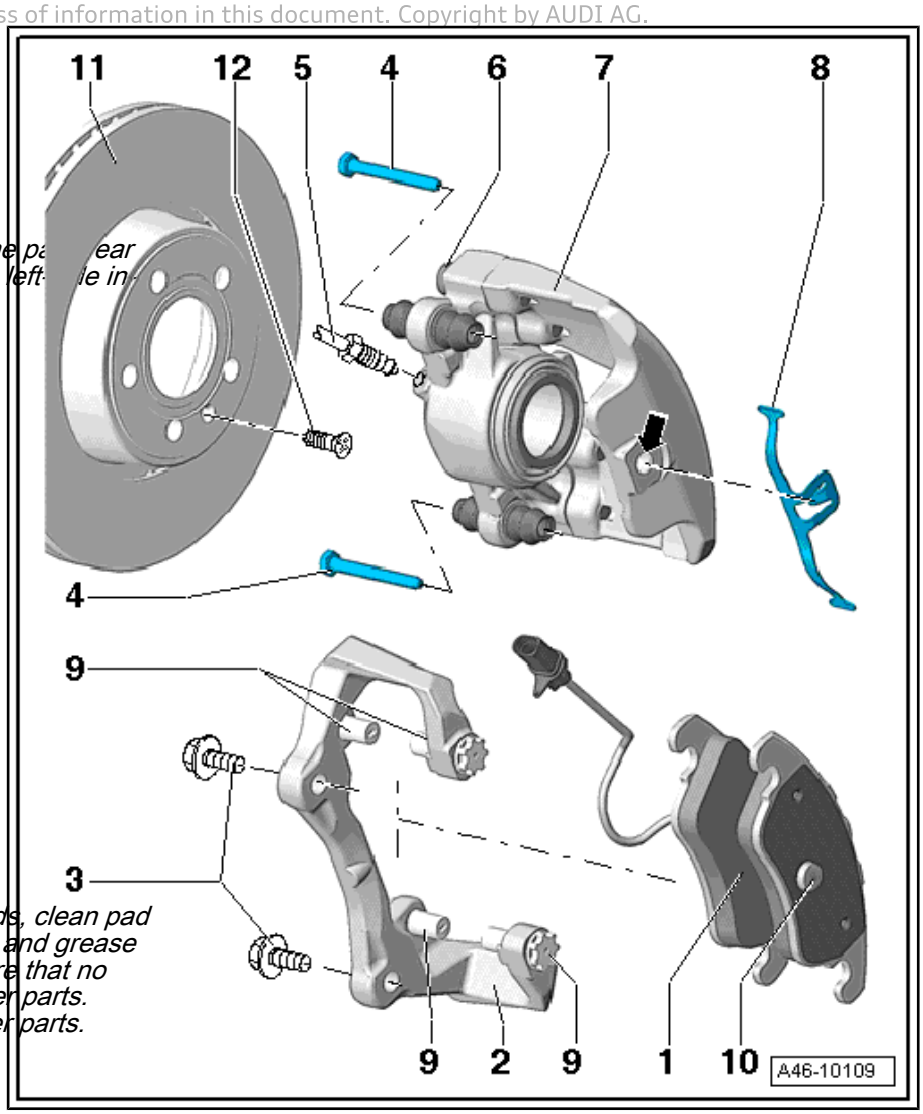
Exploded view



1 - Brake pads

- ❑ Illustration shows front left of vehicle with pad wear indicator wire

Note

An electrical wire for the pad wear indicator is fitted to the left-side inner pad (with spring).

- ❑ Always renew on both sides of axle
- ❑ Before inserting pads, clean guide surfaces and apply a thin coating of polycarbamide grease - G 052 142 A2- .
- ❑ ⇒ “1.2.2 Removing and installing brake pads (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 66
- ❑ Checking pad thickness ⇒ Maintenance ; Booklet 8K
- ❑ Different versions available ⇒ ETKA

Note

Before fitting brake pads, clean pad retaining pins -arrows- and grease lightly ⇒ ETKA . Ensure that no grease gets onto rubber parts. Clean grease off rubber parts.

2 - Brake carrier

- ❑ Bolt to wheel bearing housing
- ❑ The retaining pins for the brake pads in the brake carrier must NOT be slackened

3 - Bolt

- ❑ Brake carrier to wheel bearing housing
- ❑ 196 Nm

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

4 - Bolt

- ❑ Secure brake caliper to brake carrier
- ❑ 30 Nm

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

5 - Brake line connection on brake caliper

- ❑ 20 Nm

6 - Bolt

Caution

These bolts (4x) must NOT be slackened

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7 - Brake caliper housing

- If assembly work is required, do not leave caliper hanging from brake hose but secure it to body with wire
- Brake caliper must not be dismantled
- ⇒ “1.3.2 Removing and installing brake caliper (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 83
- ⇒ “1.4.2 Renewing brake caliper (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 91
- ⇒ “1.1.3 Exploded view - front brake caliper (FBC/1LA/1LJ)”, page 187
- With the exception of “Removing and installing brake pads”, “Servicing front brake caliper” and renewing guide pins, no repairs may be performed on the brake caliper
- Do not twist hose when fitting

8 - Spring clip

- Must be removed before removing brake pads
- Install after fitting brake pads

9 - Retaining pin for brake pads

Caution

The retaining pins (4x) for the brake pads on the brake carrier must NOT be slackened

Note

Before fitting brake pads, clean pad retaining pins -arrows- and grease lightly ⇒ ETKA . Ensure that no grease gets onto rubber parts. Clean grease off rubber parts.

10 - Locating device for brake pad in caliper

11 - Brake disc

- Wear limit ⇒ page 1
- ⇒ “1.5.2 Removing and installing brake disc (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 100
- ⇒ “1.6.2 Renewing brake disc (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 109
- Lubricate contact surfaces between brake disc and wheel hub with polycarbamide grease - G 052 142 A2- ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts .

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

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12 - Bolt for brake disc

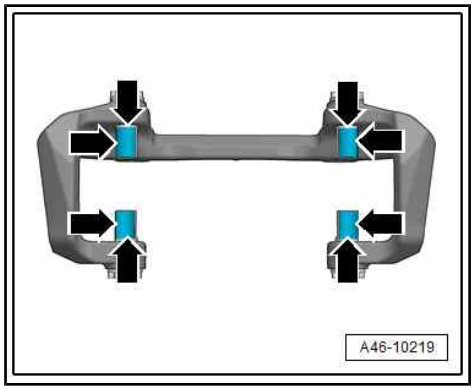
- 5 Nm

Note

Tighten bleeder screw to 14 Nm.

Note

Before fitting brake pads, clean pad retaining pins -arrows- and grease lightly ⇒ ETKA . Ensure that no grease gets onto rubber parts. Clean grease off rubber parts.



1.1.3 Exploded view - front brake (1LM)

Note

- *Always install all parts supplied in repair kit.*
- *After renewing brake pads, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.*
- *To draw off brake fluid from brake fluid reservoir use a bleeder bottle which is used only for brake fluid. Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.*

Exploded view

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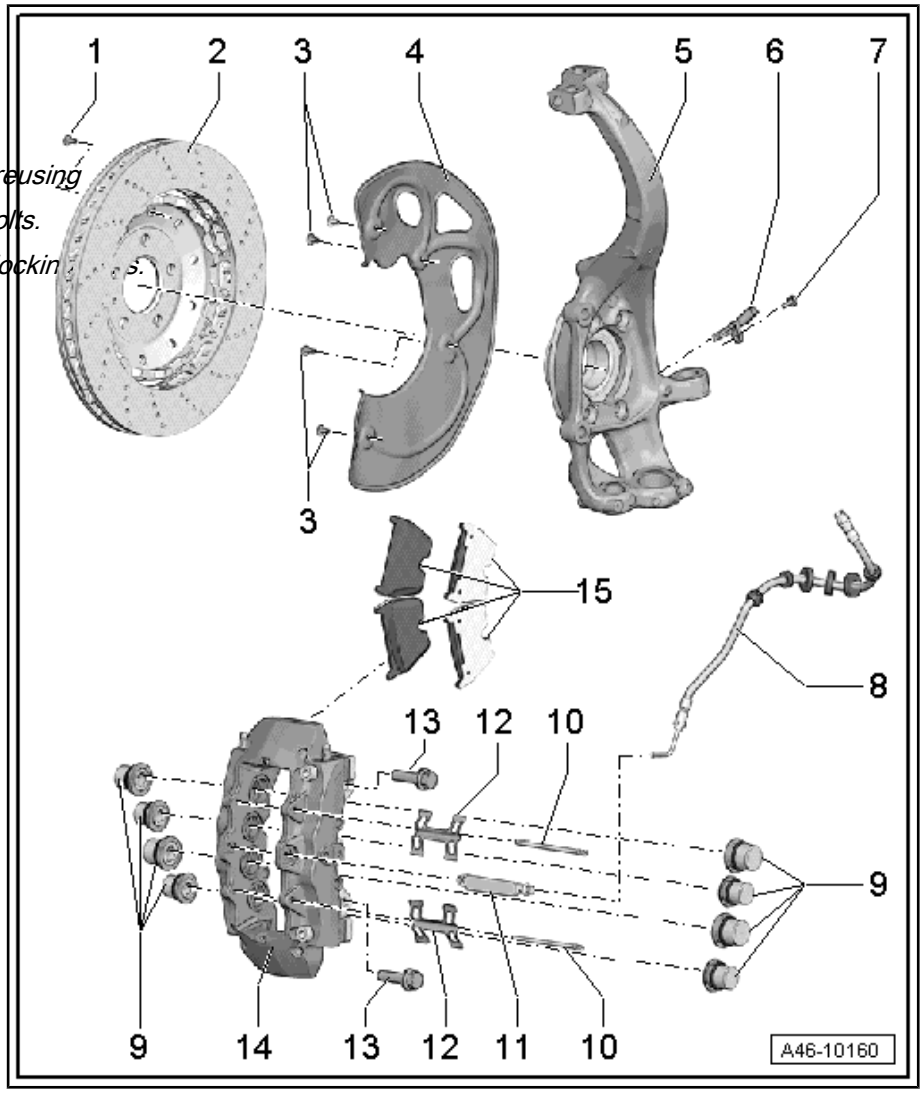

1 - Bolt

- ❑ 5 Nm

Note

- ♦ *Clean bolts before reusing.*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

2 - Brake disc

- ❑ Wear limit ⇒ page 1
- ❑ Detach brake caliper prior to removing
- ❑ Lightly lubricate contact surfaces between brake disc and wheel hub with polycarbamide grease ⇒ Parts catalogue
- ❑ ⇒ “1.5.3 Removing and installing brake disc (1LM)”, page 102
- ❑ ⇒ “1.6.3 Renewing brake disc (1LM)”, page 113

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

3 - Bolt for splash plate

- ❑ 10 Nm

4 - Splash plate

- ❑ ⇒ “1.7.3 Removing and installing splash plate (1LM)”, page 119

5 - Hub carrier

Note

Bolt bracket for brake hose and pad wear indicator wire to hub carrier.
Bolt for bracket: 9 Nm

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6 - Speed sensor

- ❑ Removing and installing

7 - Bolt

- ❑ 9 Nm

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

8 - Brake hose

Note

- *Brake hose in brake caliper, 16 Nm*
- *Brake pressure line to brake hose: 16 Nm*

9 - Brake piston

10 - Guide pin

11 -

12 - Brake pad retaining spring

- ❑ 2 fitted in each brake caliper
- ❑ Ensure correct installation position

13 - Bolt for brake caliper

- ❑ 196 Nm

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

14 - Brake caliper

- ❑ If assembly work is required, do not leave caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire.
- ❑ With the exception of “Removing and installing brake pads” and “Servicing front brake caliper”, no repairs may be performed on the brake caliper
- ❑ Do not twist hose when fitting

Note

- *Bleed brake caliper at both bleeder screws.*
- *Tightening torque for bleeder screw: 15 Nm*

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Note

Do not carry out any repairs to the brake caliper.

- ❑ ⇒ “1.3.3 Removing and installing brake caliper (1LM)”, page 84
- ❑ ⇒ “1.4.3 Renewing brake caliper (1LM)”, page 96

15 - Brake pads

- ❑ 4 fitted in each front brake caliper

WARNING

Four brake pads are fitted on each side. Only the inner, top brake pad on the left brake caliper has a connection for brake pad wear detection.

- ❑ There is an adhesive foil on the backplates of the brake pads. Remove protective foil from adhesive surface before fitting pads.
- ❑ Always renew on both sides of axle
- ❑ ⇒ “1.2.3 Removing and installing brake pads (1LM)”, page 74
- ❑ Checking pad thickness ⇒ Maintenance ; Booklet 8K

Note

Clean the brake calipers thoroughly (grease-free) before inserting new brake pads. When doing this, make sure that all adhesive foil residue on the contact surfaces for the outer brake pad is removed.

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Note

Tighten bleeder screw to 14 Nm.

1.1.4 Exploded view - front brakes, ceramic version (1LW)

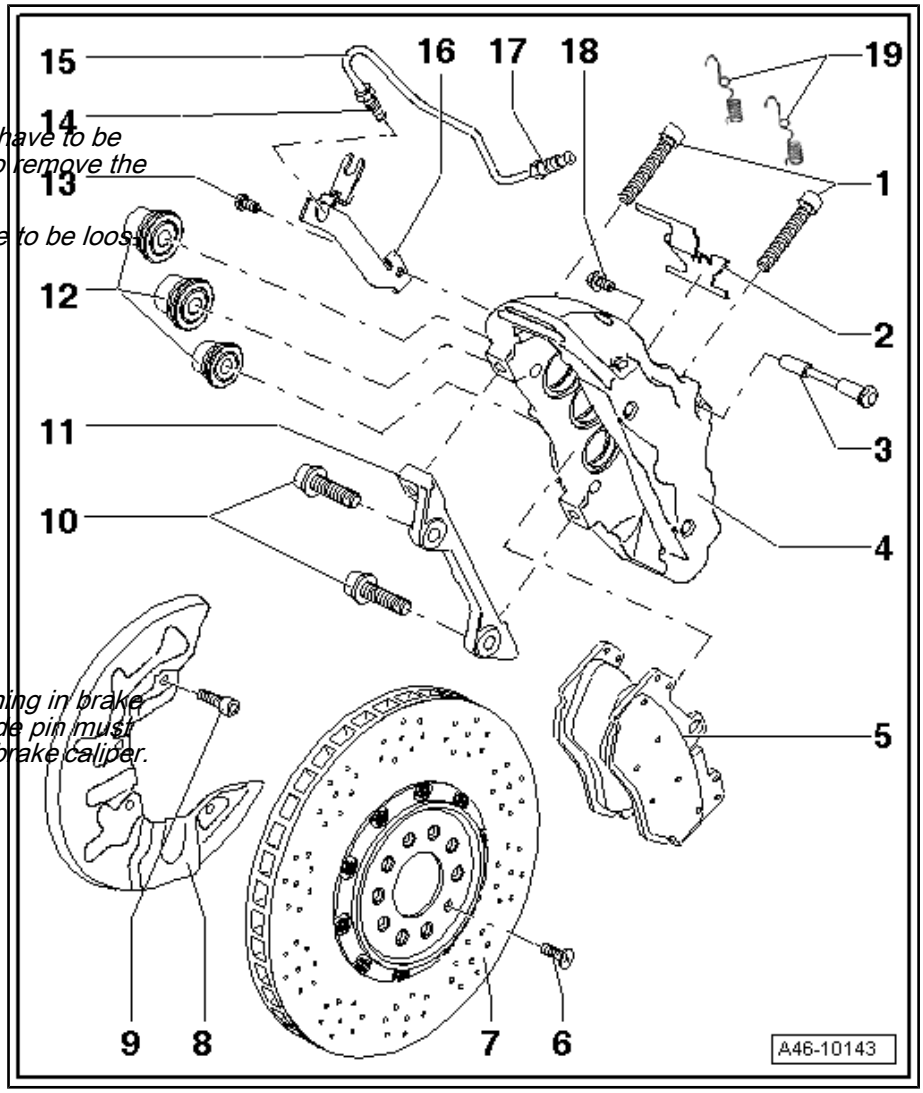
The ceramic brake discs must always be checked for damage and wear when renewing the brake pads.

- ♦ Checking ceramic brake discs for damage ⇒ page 8
- ♦ Assessing degree of wear on ceramic brake discs ⇒ page 12

Note

- ♦ *Always install all parts supplied in repair kit.*
- ♦ *After renewing brake pads, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.*
- ♦ *To draw off brake fluid from brake fluid reservoir use a bleeder bottle which is used only for brake fluid. Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.*

Exploded view



1 - Bolts for brake caliper

Note

- *These bolts do not have to be loosened in order to remove the brake caliper.*
- *Only bolts -10- have to be loosened and removed.*

2 - Retaining spring for brake pads

Pay attention to correct installation position.

3 - Guide pin

Slide pin through brake caliper and brake pads from outside to inside

Note

Ensure correct positioning in brake caliper. Groove on guide pin must be seated in groove in brake caliper.

4 - Brake caliper

- ❑ If assembly work is required, do not leave caliper hanging from brake hose but secure it to body with wire
- ❑ With the exception of “Removing and installing brake pads” and “Servicing front brake caliper”, no repairs may be performed on the brake caliper
- ❑ Do not twist hose when installing
- ❑ ⇒ “1.3.4 Removing and installing brake caliper - ceramic brakes (1LW)”, page 85
- ❑ ⇒ “1.4.4 Renewing brake caliper - ceramic brakes (1LW)”, page 97

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5 - Brake pads

Note

A wire for the wear indicator is fitted to the inner pad.

- ❑ There might be protective foil on the backplates of the brake pads. Remove the protective foil before fitting pads.
- ❑ Before fitting pads, clean guide surfaces and apply a thin coating of polycarbamide grease ⇒ Parts catalogue
- ❑ Always renew on both sides of axle
- ❑ ⇒ “1.1.4 Exploded view - front brakes, ceramic version (1LW)”, page 59
- ❑ Checking pad thickness ⇒ Maintenance ; Booklet 8K

6 - Locating bolt

- ❑ 5 Nm

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

7 - Brake disc

- ❑ Detach brake caliper prior to removing
- ❑ Lightly grease contact surfaces between brake disc and wheel hub with polycarbamide grease G 052 142 A2.
- ❑ ⇒ "1.5.4 Removing and installing brake disc - ceramic brakes (1LW)", page 103
- ❑ ⇒ "1.6.4 Renewing brake disc for ceramic brakes (1LW)", page 115

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WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

8 - Splash plate

- ❑ ⇒ "1.7.4 Removing and installing splash plate for ceramic brakes (1LW)", page 120

9 - Bolts for splash plate

- ❑ 9 Nm

10 - Bolts

Note

Loosen these bolts to remove brake caliper.

- ❑ 190 Nm

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

11 - Brake carrier

- ❑ Bolt to wheel bearing housing
- ❑ Bolted onto brake caliper

Note

The brake carrier is not available as a replacement part

12 - Brake piston

- ❑ Brake piston

WARNING

The brake pistons have different diameters. When re-installing, please make sure that each of the brake pistons is inserted in the correct aperture in the brake caliper. The ceramic inserts on the brake piston act as heat insulators and must not be separated from the brake piston. If the ceramic insert is damaged, the brake pistons must be renewed for safety reasons.

13 - Bolt for bracket

- ❑ 25 Nm

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

14 - Brake line connection at brake pipe

- ❑ Brake hose must not be twisted.
- ❑ 14 Nm

15 - Brake line

- ❑ Screw into brake caliper housing
- ❑ Screw into brake hose, counter hold on brake hose hexagon.
- ❑ Do not twist hose when fitting
- ❑ Ensure that lugs are properly seated in grooves in bracket.

16 - Bracket for brake line

- ❑ Bolt to brake caliper housing
- ❑ Attach brake line

17 - Brake pipe in brake caliper

- ❑ 16 Nm

18 - Bolt for guide pin

- ❑ 30 Nm

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

19 - Damper spring

- ❑ 2 fitted on each brake caliper
- ❑ ⇒ “1.8 Detaching and attaching damper spring”, page 122

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Note

Tighten bleeder screw to 15 Nm.

1.2 Removing and installing brake pads

⇒ “1.2.1 Removing and installing brake pads (1LT/1LY)”, page 63

⇒ “1.2.2 Removing and installing brake pads (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 66

⇒ “1.2.3 Removing and installing brake pads (1LM)”, page 74

⇒ “1.2.4 Removing and installing brake pads - ceramic brakes (1LW)”, page 76

1.2.1 Removing and installing brake pads (1LT/1LY)

When renewing the brake pads, also check the brake disc thickness. Refer to wear limit for brake disc ⇒ page 1 .

Note

Always renew on both sides of axle.

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Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Ratchet - V.A.G. 1331/1-
- Piston resetting appliance - T10145-

Removing

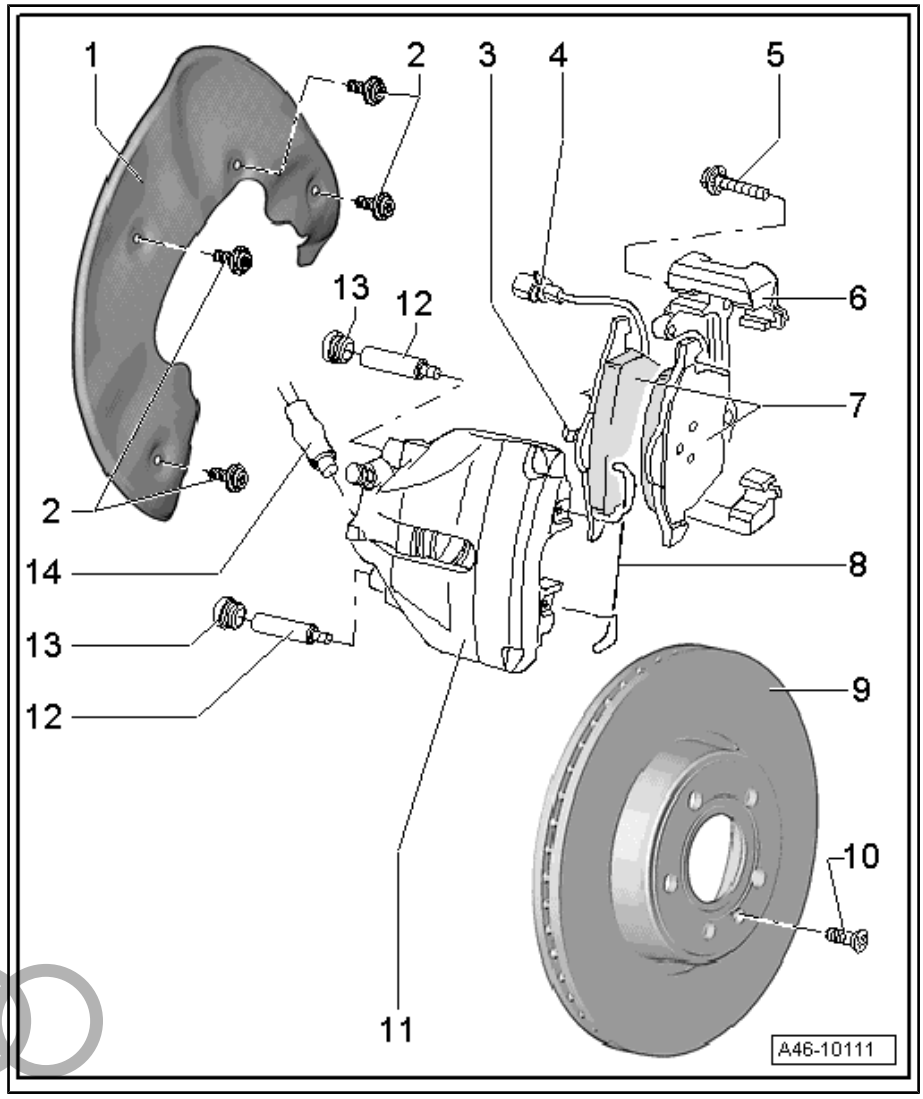
– Raise vehicle.

– Remove wheels.

Note

Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.

– Remove protective caps -13-.



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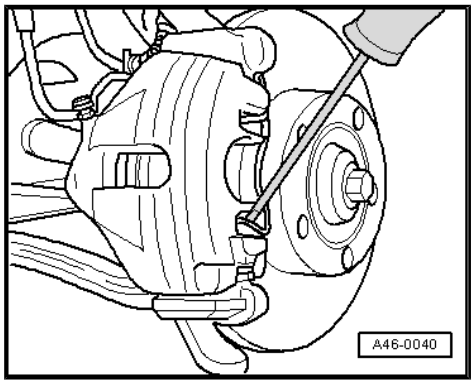
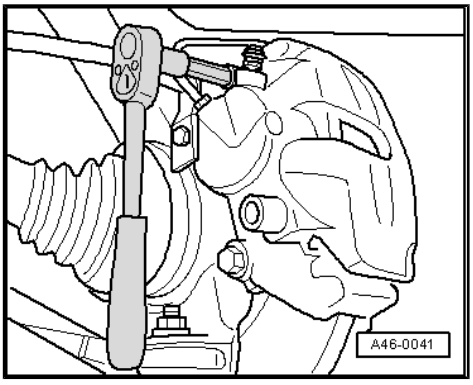
– On vehicles equipped with a brake pad wear indicator, unplug connector -4- at front left.
– Slightly lift up locating lug on lower part of connector and turn 90°.
– Pull lower part of connector for wear indicator out of bracket.
– Lever brake pad retaining spring out of brake caliper housing with a screwdriver and remove.



– Unscrew and remove both guide pins -12- from brake caliper.



Tie brake caliper up to vehicle using a suitable wire. Take care that brake hose is not damaged by weight of brake components.

– Take brake pads out of brake caliper housing or from brake carrier.

Installing

When renewing the brake pads, also check the brake disc thickness. Refer to wear limit for brake disc.

– Check brake disc for wear; wear limit ⇒ page 1 .

– Clean brake caliper housing.

Use only methylated spirits to clean the brake caliper housing.

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Note

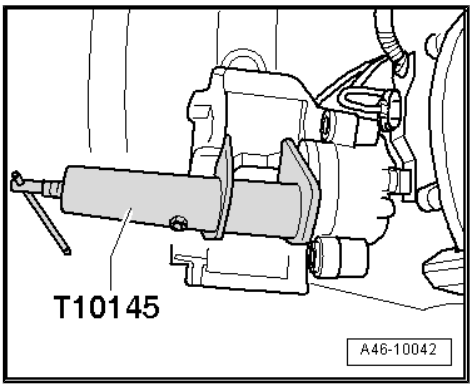
Before inserting new brake pads, press piston back into cylinder with resetting appliance. Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if the reservoir has been topped up.

WARNING

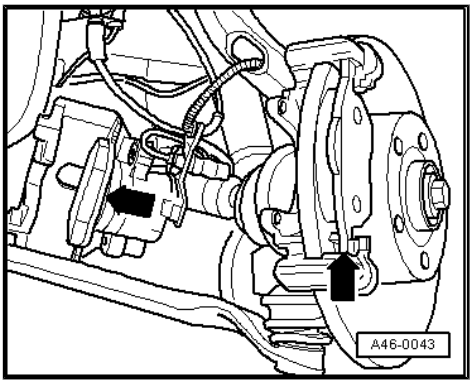
Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.

– Press piston back.

Use piston resetting appliance T10145.



– Insert brake pad with retaining spring in brake caliper housing (piston).



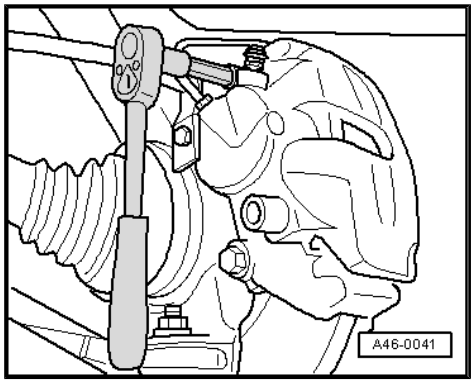
Note

The inner pad (with spring) has an arrow. The arrow must point in direction of brake disc rotation when moving forwards. May create noises if incorrectly installed.

– If fitted, pull protective foil off pad backplates.

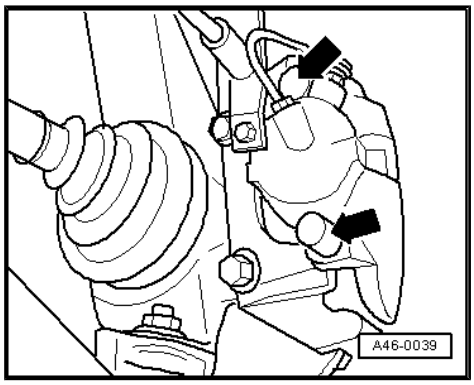
– Fit outer brake pad onto brake carrier.

– Screw both guide pins into brake caliper housing and tighten.



– Fit both protective caps -arrow-.

– Insert retaining spring into brake caliper housing.



Note

- *The retaining spring must be pressed under the brake carrier after inserting into both holes. If incorrectly installed, the wear of the outer pad cannot be adjusted, and the pedal travel will be increased as a result.*
- *After installing the brake pads, depress the pedal firmly several times with the vehicle stationary, so that the pads are properly seated in their normal operating position.*

– Check brake fluid level and top up if necessary.

Note

Make sure that the brakes work properly before the vehicle is driven on the road.

WARNING

Make sure that the brakes work properly before the vehicle is driven on the road.

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1.2.2 Removing and installing brake pads (1LA/1LB/1LJ/1LD/1ZT and S4/S5)

When renewing the brake pads, also check the brake disc thickness. Refer to wear limit for brake disc ⇒ page 1 .

Note

Always renew on both sides of axle.

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Ratchet - V.A.G. 1331/1-
- Piston resetting appliance - T10145-

Removing

– Raise vehicle.

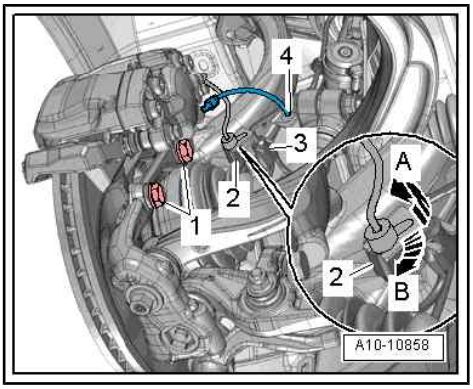
– Remove wheels.

Note

Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.

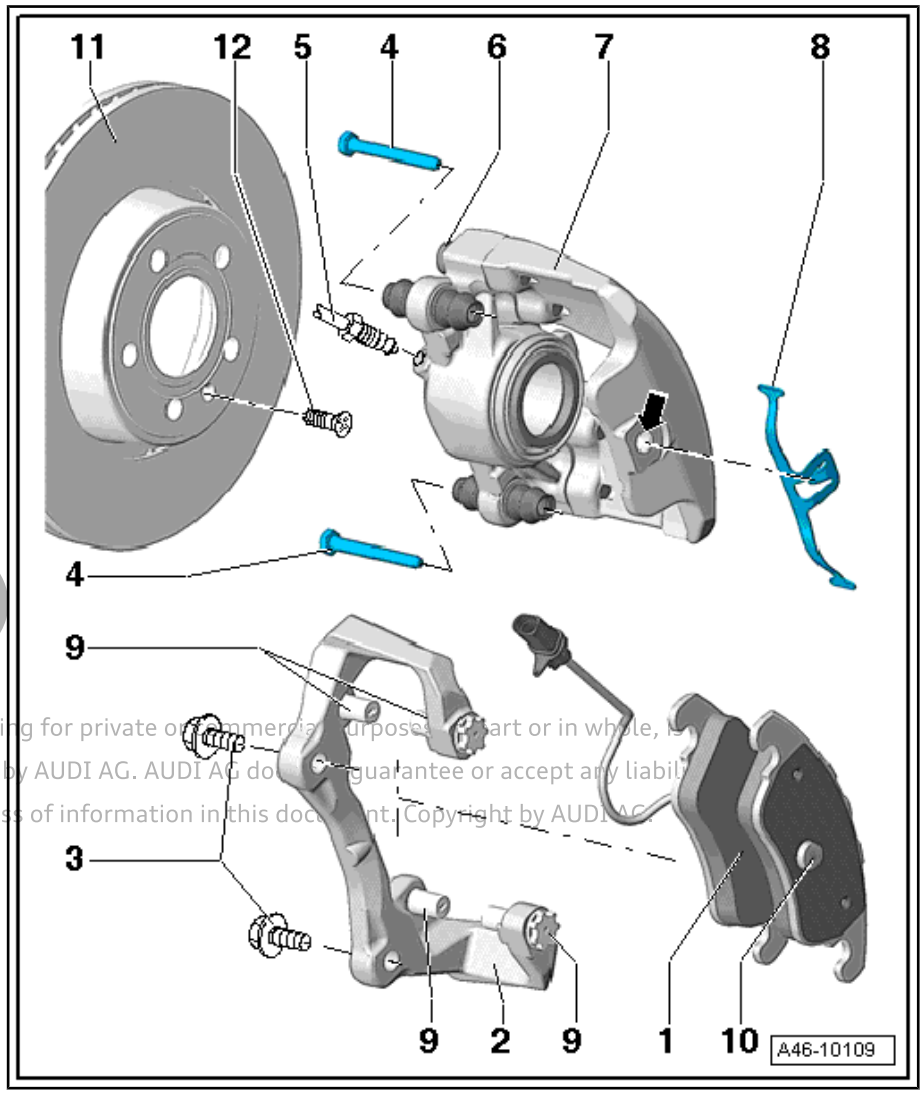
– Move brake hose clear from bracket -4-.

– Release electrical wire towards the left -arrow A- from bracket -2- and detach.



WARNING

The four retaining pins for the brake pads -9- must NOT be slackened.



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– Press down centre of retaining spring -8-.

Note

- *The spring is under tension; hold your hand over the spring to avoid risk of injury.*
- *When removing the spring, take care not to scratch or chip the paint on the brake caliper.*

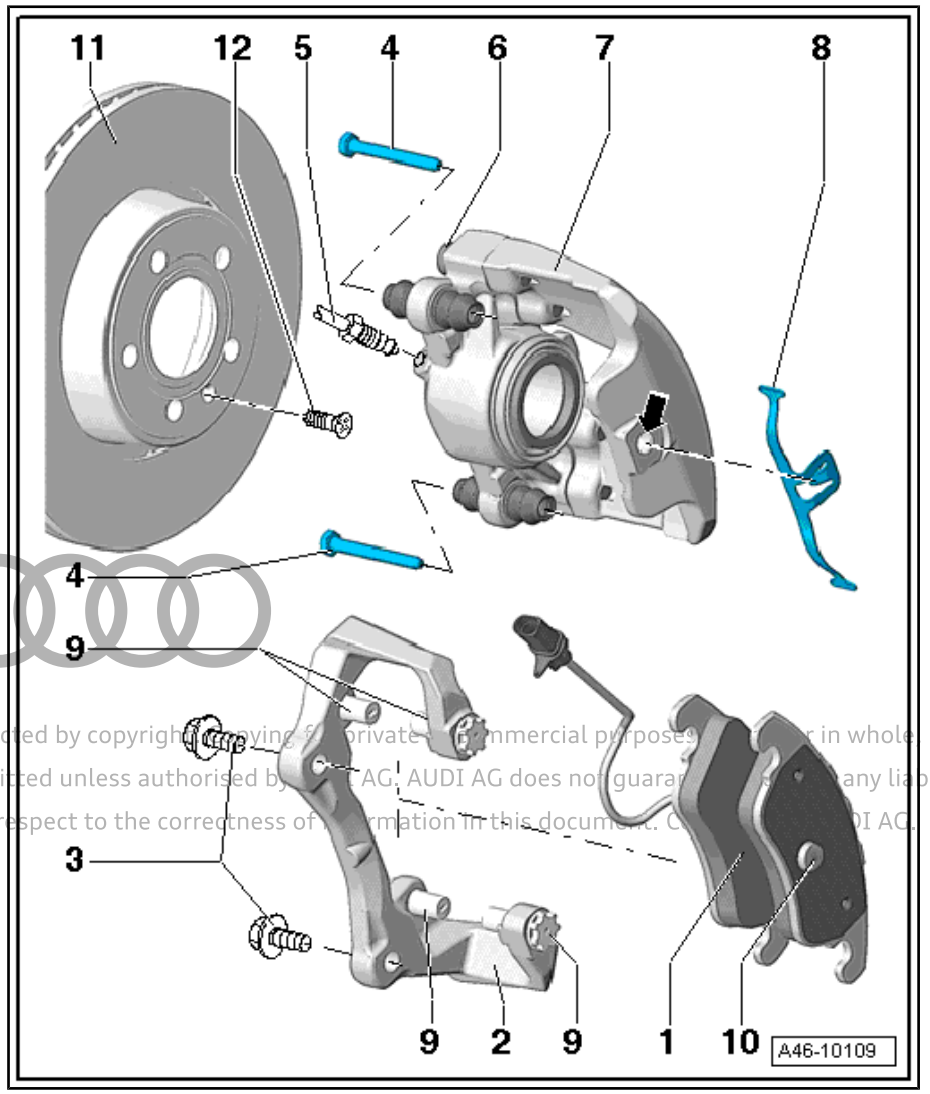
– Carefully detach retaining spring.

– Unplug electrical connector for brake pad wear indicator (front left).

Note

The brake pad wear sender is only fitted on the inner pad in the front left brake caliper.

– Unscrew both bolts -4- for guide pins and remove from brake caliper.



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Caution

Do NOT slacken bolts -6 and 9-

– Pull both guide pins slightly out of brake caliper to facilitate removal of caliper.

– Detach brake caliper.

Do not leave brake caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

– Take brake pads out of brake caliper housing or from brake carrier.

WARNING

The four retaining pins for the brake pads in the brake caliper must NOT be slackened.

Installing

When renewing the brake pads, also check the brake disc thickness. Refer to wear limit for brake disc.

– Check brake disc for wear; wear limit ⇒ page 1 .

– Clean brake caliper.

Use only methylated spirits to clean the brake caliper housing.

Note

Before inserting new brake pads, press piston back into cylinder with resetting appliance. Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if the reservoir has been topped up.

WARNING

Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.

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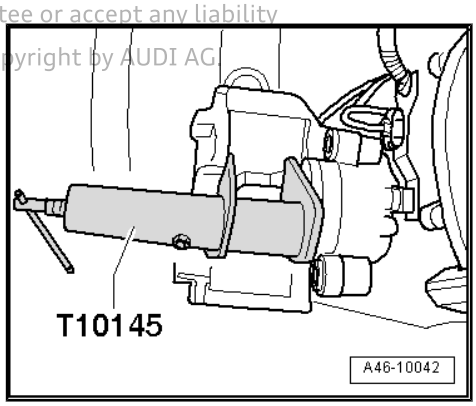
– Press piston back.

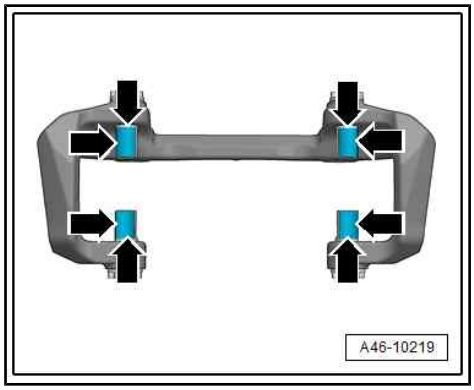
Use piston resetting appliance T10145.



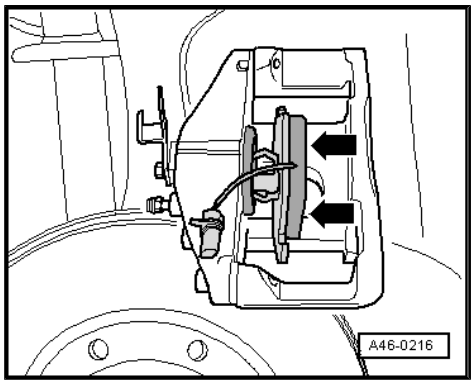
Note

Before fitting brake pads, clean pad retaining pins -arrows- and grease lightly ⇒ ETKA . Ensure that no grease gets onto rubber parts. Clean grease off rubber parts.

– If fitted, pull protective foil off pad backplates.

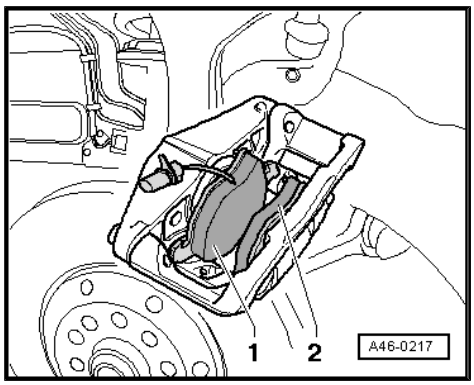


– Fit inner brake pad with retaining spring in brake caliper. Retaining spring -arrow- must be seated in brake piston.



– Fit outer brake pad -2- in brake caliper.

The backplate of the brake pad has a locating device -10-, which must fit securely in the aperture in the caliper.



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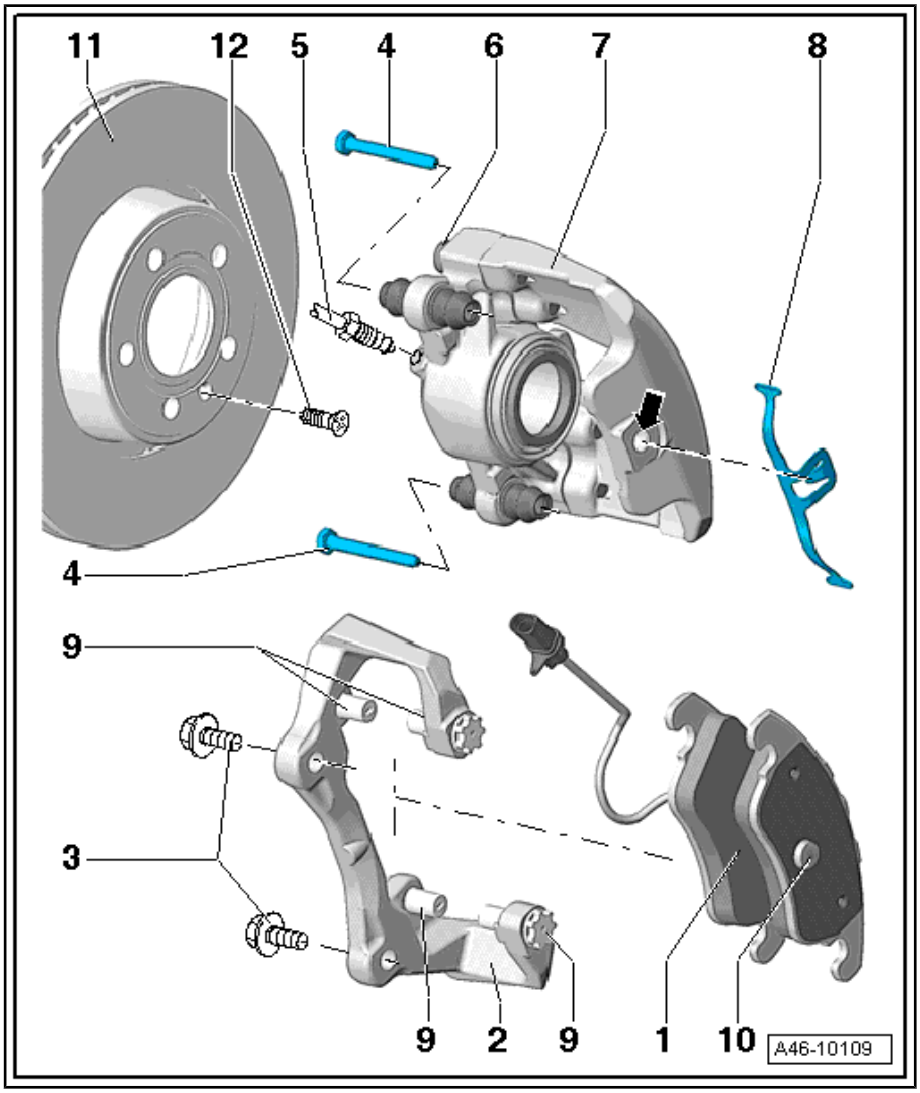

WARNING

Both brake pads must be seated under the retaining pins in the caliper. The brake caliper has two retaining pins on each side, which must not be slackened.

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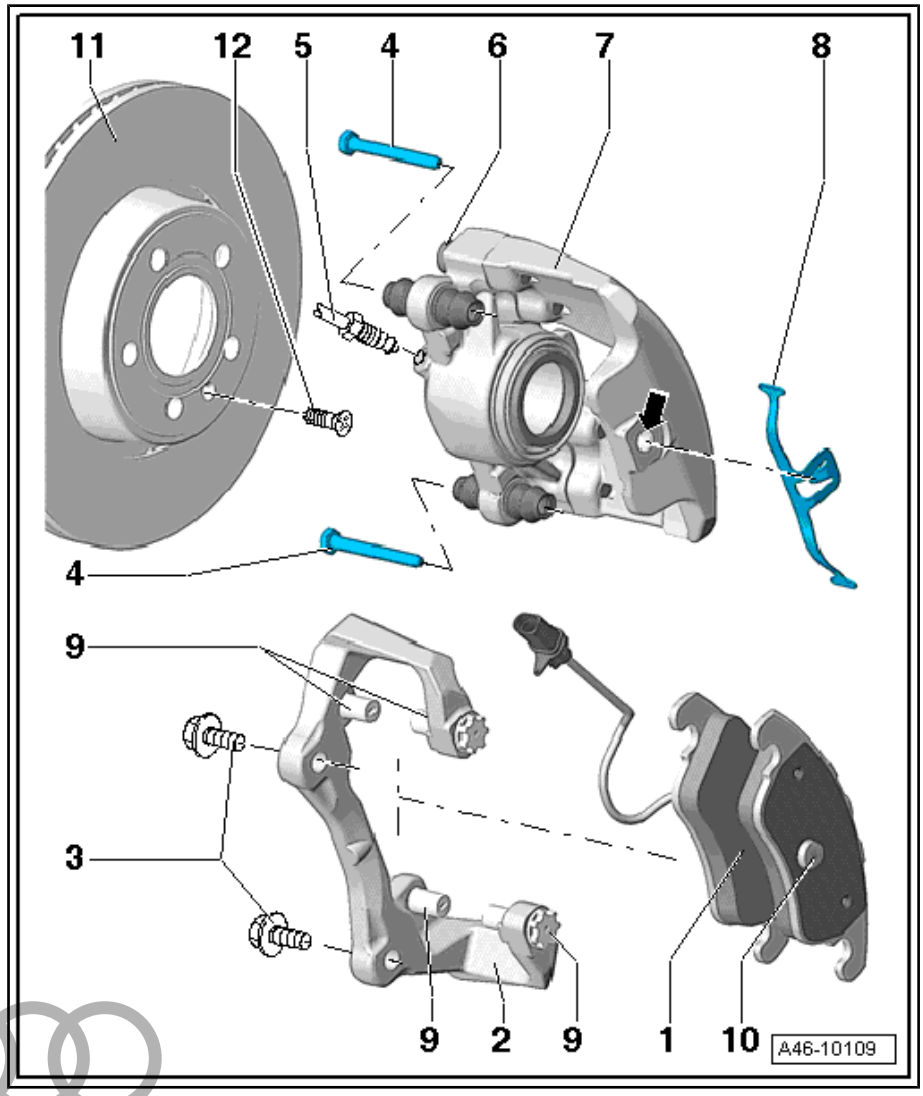
– Carefully fit brake caliper (with brake pads) over brake disc.

– Secure brake caliper to brake carrier with both guide pins -4-.



– Press down centre of retaining spring and fit centre tab of spring in hole -arrow- in brake caliper.

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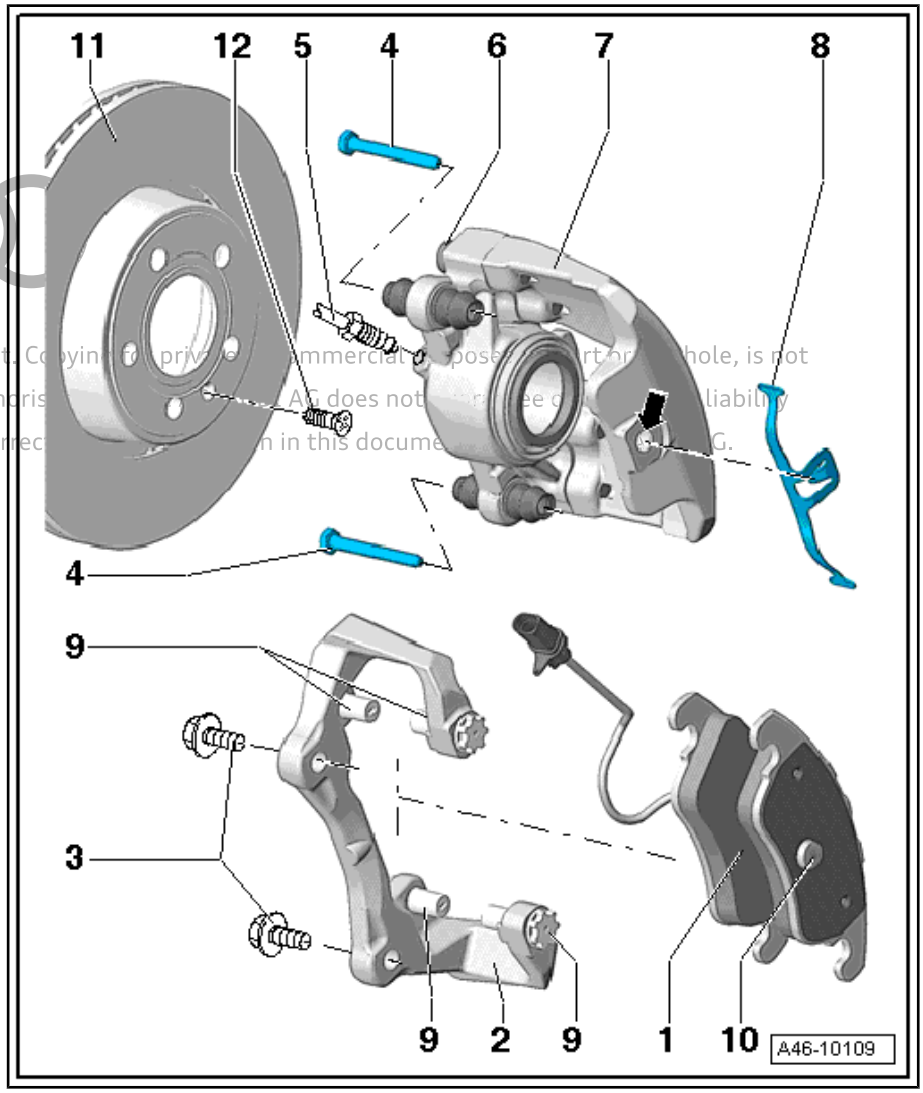

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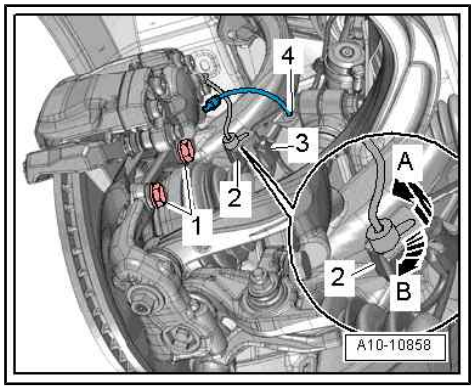
The tab of the retaining spring -8- must be seated properly in the hole in the brake caliper; otherwise the spring can become detached and the pad would not be secured.

Note

- *The spring is under tension; hold your hand over the spring to avoid risk of injury.*
- *When fitting the spring, take care not to scratch or chip the paint on the brake caliper.*

– Attach electrical connector for pad wear indicator in bracket (front left).

– Fit electrical wire -2- in bracket and turn to the right -arrow B- to secure.
– Fit brake hose in bracket -4-.
– Plug in electrical connector for brake pad wear indicator (front left).
– Install wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts .



Note

After installing the brake pads, depress the pedal firmly several times with the vehicle stationary, so that the pads are properly seated in their normal operating position.

– Check brake fluid level and top up if necessary.

1.2.3 Removing and installing brake pads (1LM)

When renewing the brake pads, also check the brake disc thickness. Refer to wear limit for brake disc ⇒ page 1 .

WARNING

Four brake pads are fitted on each side. Only the inner, top brake pad on the left brake caliper has a connection for brake pad wear detection.

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Removing

Note

- *The brake caliper does not have to be detached in order to remove the brake pads.*
- *Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.*

– Raise vehicle.
– Remove wheels.
– Unplug connector for brake pad wear sender (on left brake caliper).
– Remove wear indicator cable from left bracket.

– Slide guide pins -10- (top and bottom) out of brake caliper (hold corresponding retaining spring firmly while doing so).

WARNING

Retaining spring is under tension and could cause injury when pulling out the guide pin if suitable precautions are not taken.

– Remove retaining springs -12- (top and bottom).

– Press back brake pistons using piston resetting appliance -T10145- .

The brake pistons can be pressed back with the old brake pads while they are still fitted so that all of the pistons in the brake caliper are pressed back evenly.

Note

- *Before removing old brake pads, press pistons back into cylinders with resetting appliance.*
- *Make sure that paint on brake caliper is not damaged.*
- *Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if the reservoir has been topped up.*

WARNING

Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.

– Remove brake pads (top and bottom) from brake caliper.

– Clean brake caliper housing.

Use only methylated spirits to clean the brake caliper housing.

Installing

When renewing the brake pads, also check the brake disc thickness. Refer to wear limit for brake discs.

– Check brake disc for wear; wear limit ⇒ page 1 .

– Fit brake pads (top).

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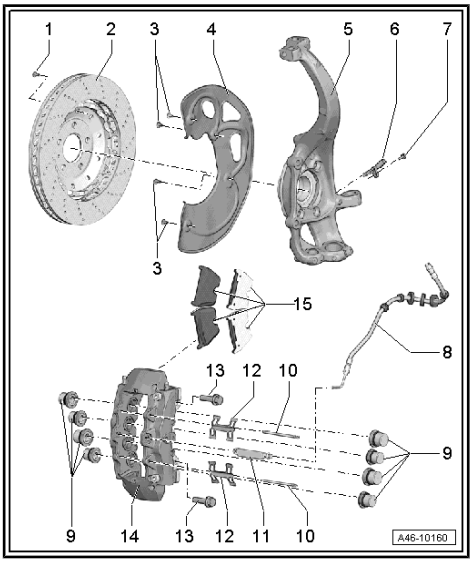
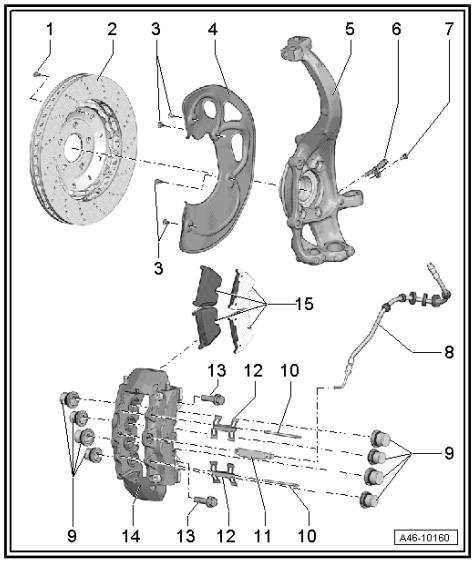
WARNING

Four brake pads are fitted on each side. Only the inner, top brake pad on the left brake caliper has a connection for brake pad wear detection.



– Insert retaining spring (top) -12-.
– Slide guide pin (top) -10- into brake caliper.
– Fit brake pads (bottom).
– Insert retaining spring (bottom) -12-.
– Slide guide pin (bottom) -10- into brake caliper.

Make sure that brake pads are seated correctly in brake caliper.



WARNING

After introducing the guide pins, the corresponding retaining spring must be pressed underneath each guide pin so that the spring is under tension. If the retaining spring is fitted incorrectly, the brake pads will be out of position and the function of the brakes will be impaired. The guide pins must be inserted all the way into the brake caliper to ensure that they stay in place.

– Insert cable for wear indicator into bracket on left brake caliper.
– Plug in connector for brake pad wear sender at left inner brake pad (top).
– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Check brake fluid level and top up if necessary.

Caution

Before the vehicle is driven, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

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1.2.4 Removing and installing brake pads - ceramic brakes (1LW)

Check the brake disc for wear and damage when removing the brake pads.

- Checking ceramic brake discs for damage ⇒ page 8
- Assessing degree of wear on ceramic brake discs ⇒ page 12

Removing

Note

- *The brake caliper does not have to be detached in order to remove the brake pads.*
- *Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.*

The ceramic brake discs must always be checked for damage and wear when renewing the brake pads.

- Checking ceramic brake discs for damage ⇒ page 8
- Assessing degree of wear on ceramic brake discs ⇒ page 12

– Raise vehicle.

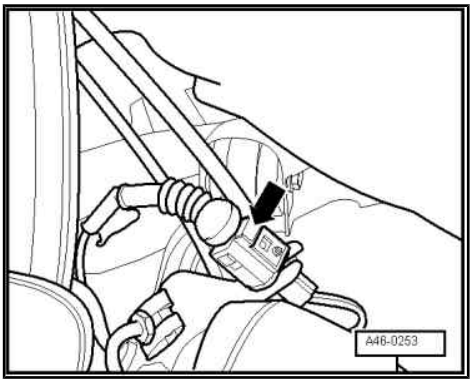
– Remove wheels.

Caution

On vehicles with ceramic brakes the wheel must not be allowed to drop onto the brake disc. This would cause irreparable damage to the disc. Screw two assembly pins (from vehicle tool kit) into the wheel bolt holes when removing and fitting a wheel. Insert the long assembly pin into the top hole.

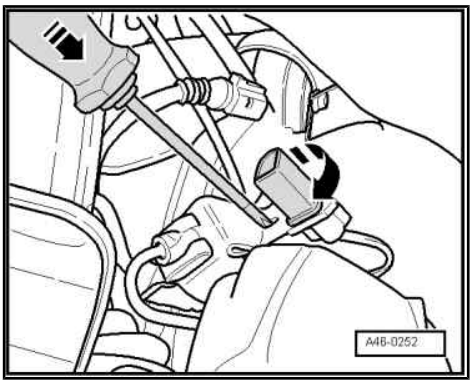
– Secure brake disc with one wheel bolt.

– Unplug connector for brake pad wear indicator as shown in illustration.



– Turn connector 90° while using a screwdriver to release connector from bracket.

– Pull connector upwards out of bracket and detach wire.



Note

The brake caliper does not have to be detached in order to remove the brake pads.

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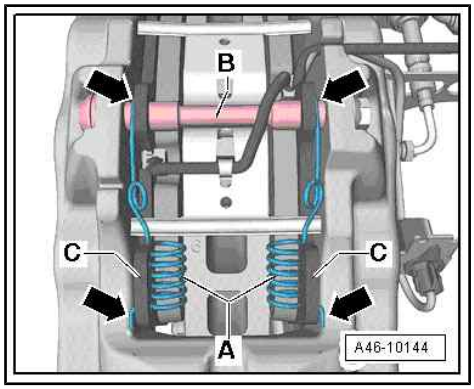
– First disengage damper springs -A- (left and right) from guide pin -B- using commercially available pliers.
– Then pull damper springs -A- out of brake pads -C-.
– Remove bolt for guide pin -B-.
– Pull guide pin out of brake pads and brake caliper.



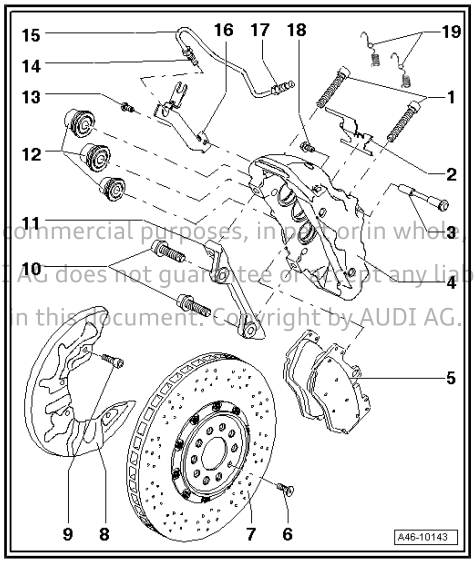
WARNING

Retaining spring is under tension and could cause injury when pulling out the guide pin if suitable precautions are not taken.

– Disengage wire for brake pad wear sender from retaining spring -2-.

Note

Before removing old brake pads, press pistons back into cylinders with resetting appliance. Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if the reservoir has been topped up.



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WARNING

Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.

– Remove retaining spring -2-.
– Remove brake pads from brake caliper housing.

Use only methylated spirits to clean the brake caliper housing.

Installing

Check the brake disc for wear and damage when removing the brake pads.

– Check brake disc.
♦ Checking ceramic brake discs for damage ⇒ page 8
♦ Assessing degree of wear on ceramic brake discs ⇒ page 12
– Insert brake pads into brake caliper.

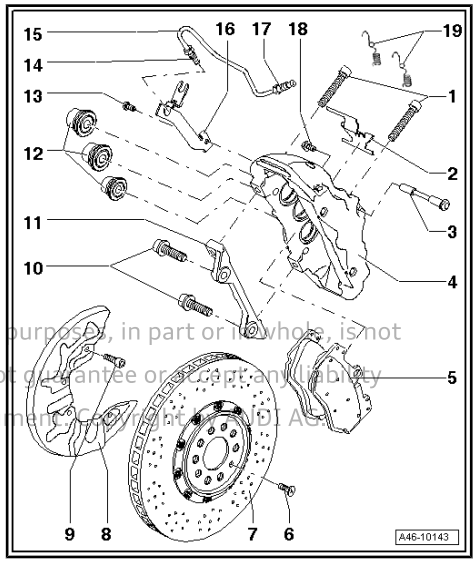
Note

The brake pad with the wear indicator wire is located on the inside.

– Insert retaining spring in brake caliper housing -2-.
– Press guide pin -3- through brake caliper and brake pads.

WARNING

After introducing the guide pin, the retaining spring must be pressed underneath the guide pin so that it is under tension. If the retaining spring is fitted incorrectly, the brake pads will be out of position and the function of the brakes will be impaired.



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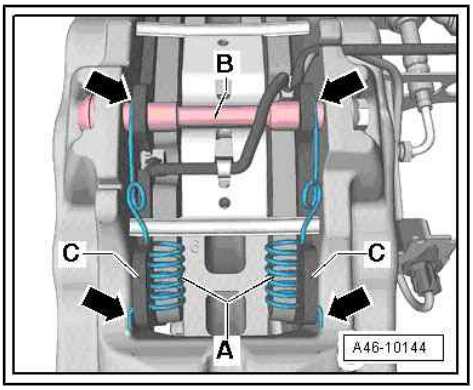
– Tighten bolt -18- for guide pin to specified torque.

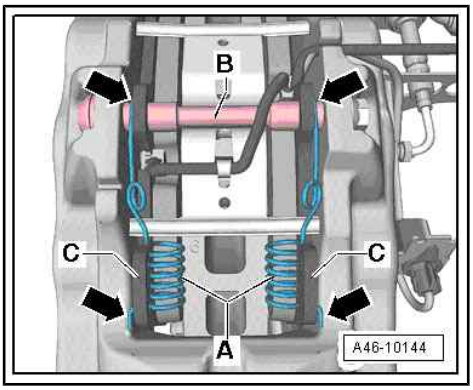
– First engage damper springs -A- (left and right) in bottom hole in corresponding brake pads -C-.
– Then engage damper springs -A- (left and right) in guide pin -B- using commercially available pliers.

Caution

Make sure that the damper springs are fitted correctly at the guide pin and brake pads.



Installation position of damper springs at guide pin and brake pads -arrows-

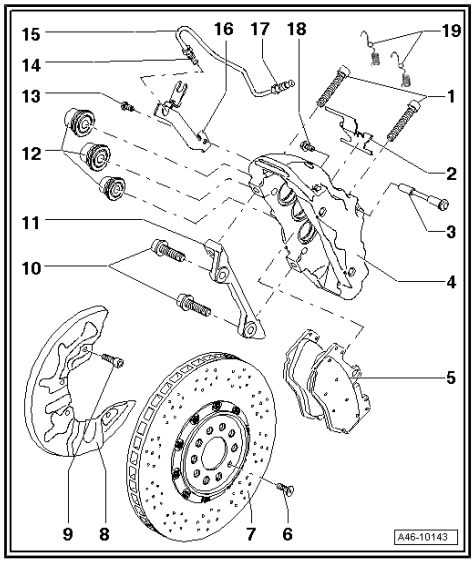


– Connect wear indicator connector and insert wire in dust cap and protective cap.

Note

It is important to ensure that the pad wear sender wire is inserted in the retaining spring -2-.

– Insert wire for brake pad wear sender in retaining spring -2-.
– Install wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts .
– Check brake fluid level and top up if necessary.



Caution

After installing the brake pads and before driving the vehicle, depress brake pedal firmly several times with the vehicle stationary, so that the brake pads are properly seated in their normal operating position.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.3 Removing and installing brake caliper

⇒ "1.3.1 Removing and installing brake caliper (1LT/1LY)", page 80

⇒ "1.3.2 Removing and installing brake caliper (1LA/1LB/1LJ/1LD/1ZT and S4/S5)", page 83

⇒ "1.3.3 Removing and installing brake caliper (1LM)", page 84

⇒ "1.3.4 Removing and installing brake caliper - ceramic brakes (1LW)", page 85

1.3.1 Removing and installing brake caliper (1LT/1LY)

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

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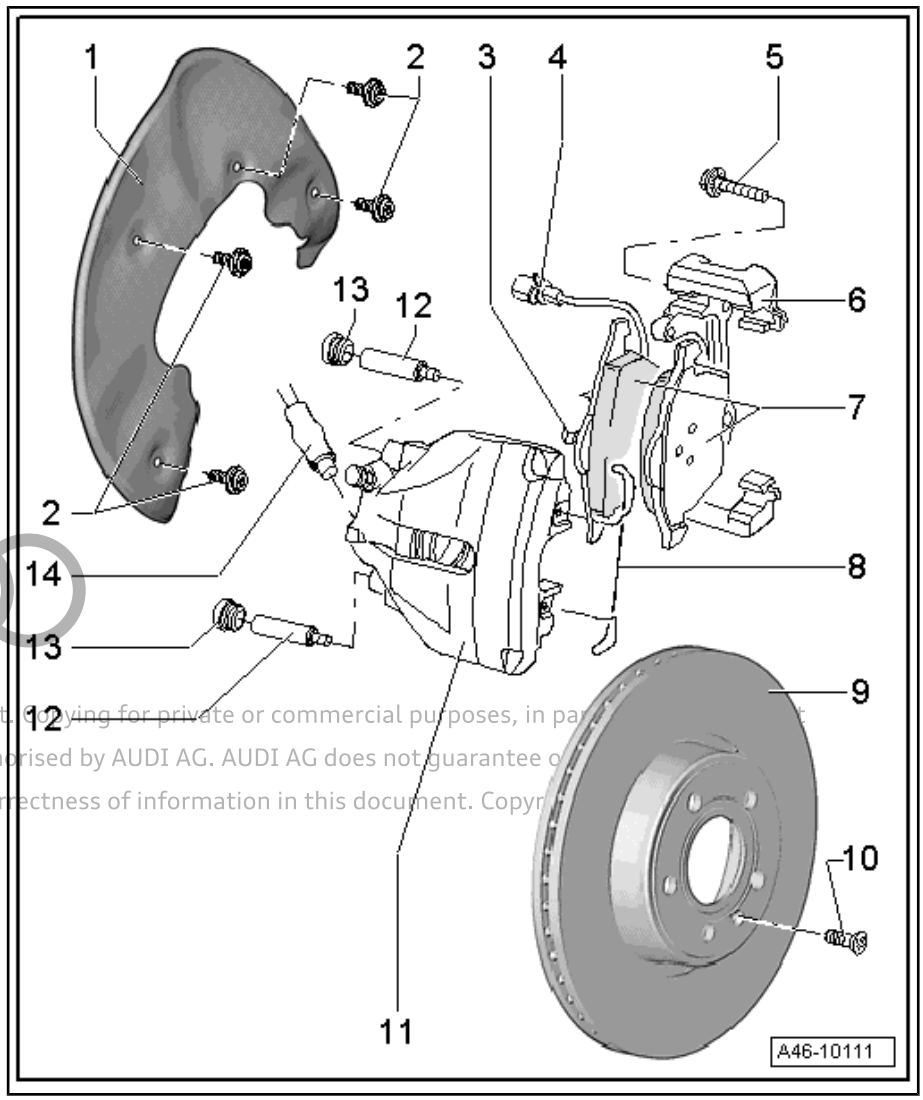
Detaching

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-
- Ratchet - V.A.G. 1332/1-

– Raise vehicle.
– Remove wheels.
– Detach brake hose from bracket.

– Unplug brake pad wear indicator on brake caliper (left-side).
– Remove bolts -5- on brake carrier.



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– Detach brake carrier with pads and caliper.

Do not leave brake caliper and brake carrier hanging from brake hose but secure them to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

WARNING

Do not apply brake when brake caliper is removed.

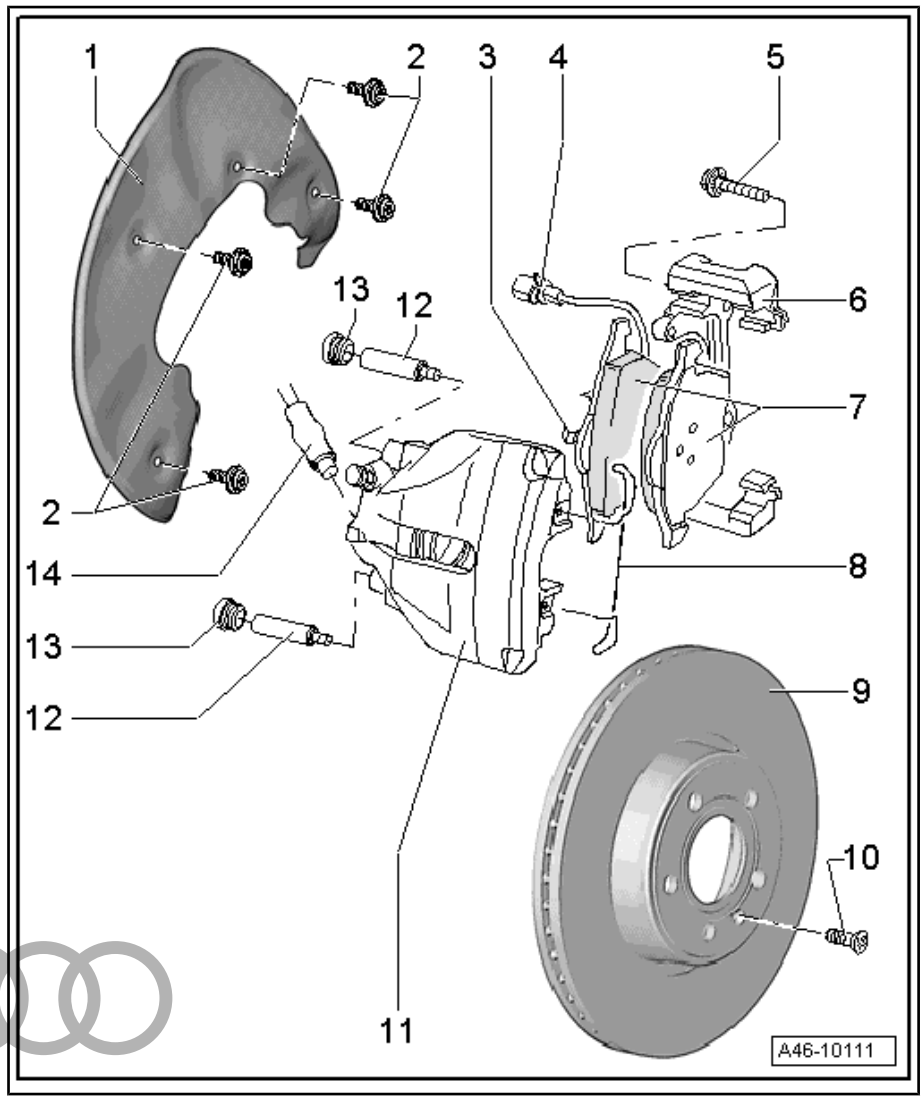
Installing

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

– Carefully press brake caliper and brake carrier (with brake pads fitted) over brake disc.

– Secure brake carrier with bolts -5-.



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– Fit brake hose in bracket.

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Lower vehicle.

1.3.2 Removing and installing brake caliper (1LA/1LB/1LJ/1LD/1ZT and S4/S5)

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

Detaching

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-
- Ratchet - V.A.G. 1332/1-

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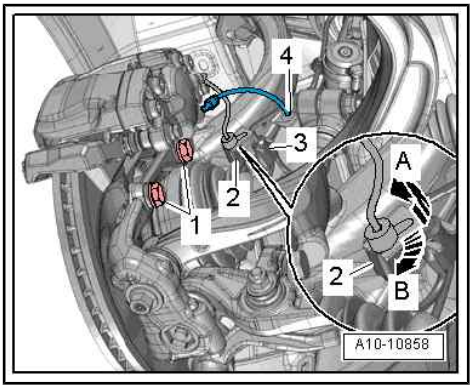
– Raise vehicle.
– Remove wheels.
– Move brake hose clear from bracket -4-.
– Release electrical wire towards the left -arrow A- from bracket -2- and detach.
– Remove bolts -1- on brake carrier.
– Detach brake caliper with pads and brake carrier.



Do not leave brake caliper and brake carrier hanging from brake hose but secure them to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

WARNING

Do not apply brake when brake caliper is removed.

Installing

Note

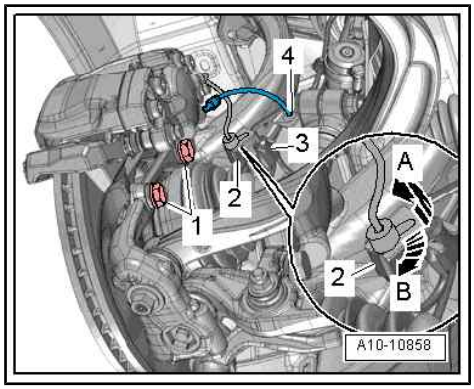
- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

– Carefully press brake caliper and brake carrier (with brake pads fitted) over brake disc.

– Secure brake carrier with bolts -1-.
– Fit brake hose in bracket -4-.
– Fit electrical wire -2- in bracket and turn to the right -arrow B- to secure.
– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Lower vehicle.



1.3.3 Removing and installing brake caliper (1LM)

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

Note

Note

The brake pads do not have to be removed in order to detach the brake caliper.

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Removing

– Raise vehicle.
– Remove wheels.
– Detach brake hose from bracket.
– Press brake pads slightly back into brake caliper.

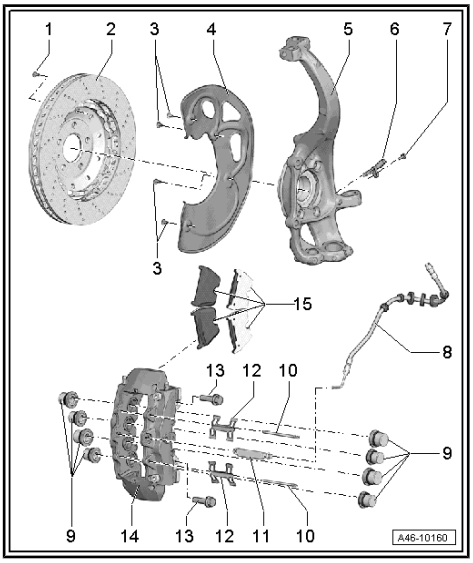
The brake pistons can be pressed back by applying commercially available pliers to the old brake pads while they are still fitted so that all of the pistons in the brake caliper are pressed back evenly.

Note

- *Make sure that brake pads and paint on brake caliper are not damaged.*
- *Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if the reservoir has been topped up.*

– Remove bolts -13- (hold brake caliper firmly).
– Carefully detach brake caliper from brake disc.

Do not leave brake caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire.



WARNING

Do not apply brake when brake caliper is removed.

Installing

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

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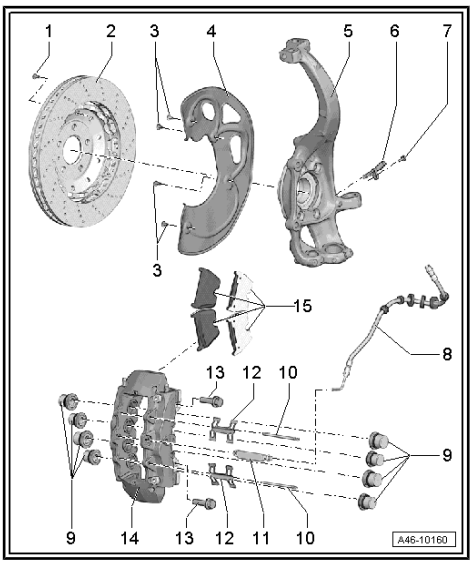
Note

– Carefully press brake caliper (with brake pads fitted) over brake disc.



– Tighten bolts -13- to secure brake caliper.
– Insert brake hose in bracket.
– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Lower vehicle.

Caution

Before the vehicle is driven, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.3.4 Removing and installing brake caliper - ceramic brakes (1LW)

Note

Do not loosen bolts -1- to remove brake caliper.

4 - Brake caliper

- ❑ If assembly work is required, do not suspend caliper from brake hose but tie it to body with a piece of wire.

10 - Bolts

Note

Always renew if removed

- ❑ 196 Nm

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11 - Brake carrier

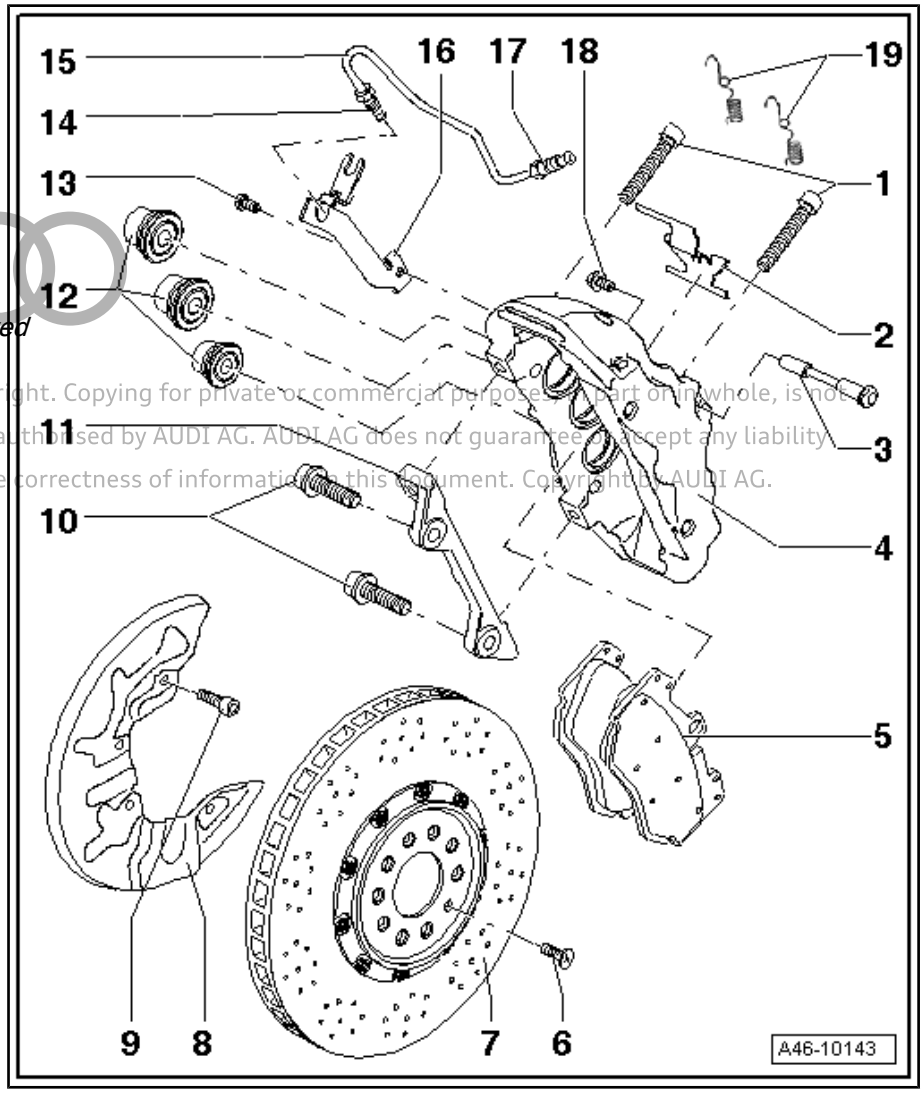
- ❑ Bolt to wheel bearing housing
- ❑ Bolted onto brake caliper
- ❑ 190 Nm

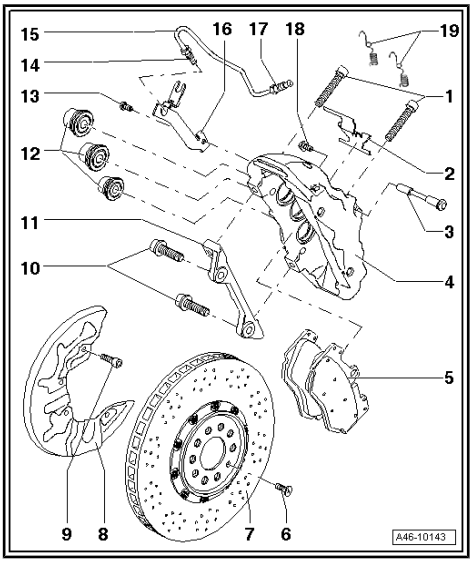
13 - Bolt for bracket

- ❑ 25 Nm

16 - Bracket for brake line

- ❑ Attach brake line





Note

Do not loosen bolts -1- to remove brake caliper.

Removing

– Remove bracket for brake line.
– Loosen and remove the two bolts -10- on the brake carrier.
– Remove brake caliper. Leave brake carrier -11- in position on brake caliper.

Installing

– Installation is carried out in reverse sequence.

Note

Take care not to twist brake hose.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.4 Renewing brake caliper

⇒ “1.4.1 Renewing brake caliper (1LT/1LY)”, page 87

⇒ “1.4.2 Renewing brake caliper (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 91

⇒ “1.4.3 Renewing brake caliper (1LM)”, page 96

⇒ “1.4.4 Renewing brake caliper - ceramic brakes (1LW)”, page 97

1.4.1 Renewing brake caliper (1LT/1LY)

Note

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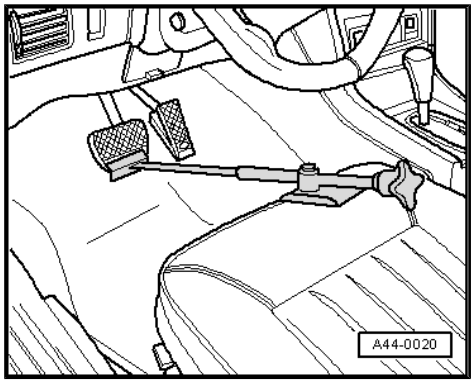
- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

Removing

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-
- Ratchet - V.A.G. 1332/1-
- Torque wrench - V.A.G 1331-
- Ratchet - V.A.G. 1331/1-
- Brake pedal actuator - V.A.G 1869/2-
- Piston resetting appliance - T10145-

– Insert brake pedal actuator -V.A.G 1869/2- between brake pedal and driver's seat (depress brake pedal at least 60mm). This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.
– Raise vehicle.
– Remove wheels.
– Connect hose of bleeder bottle to bleeder screw of front brake caliper.
– Open bleeder screw on front brake caliper to release pressure from brake system.
– Close bleeder screw (13 Nm).



Note

Do not remove brake pedal actuator -V.A.G 1869/2- .

– Remove brake pads ⇒ page 63 .

Note

♦ *Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.*
♦ *The brake disc is secured with a bolt.*

– Disconnect brake hose from brake caliper.
– Remove brake caliper from vehicle.
– Remove bolts -5- on brake carrier, holding brake carrier firmly.

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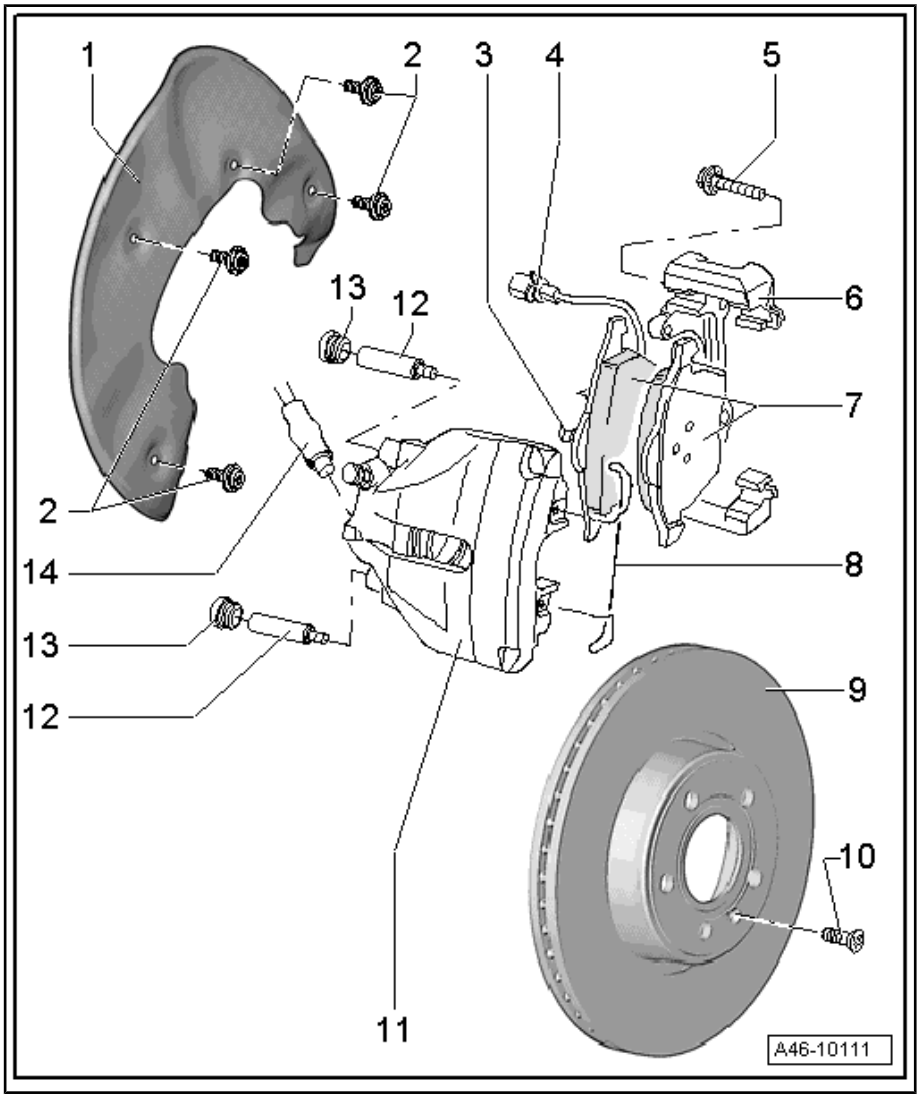

– Detach brake carrier.

Installing

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

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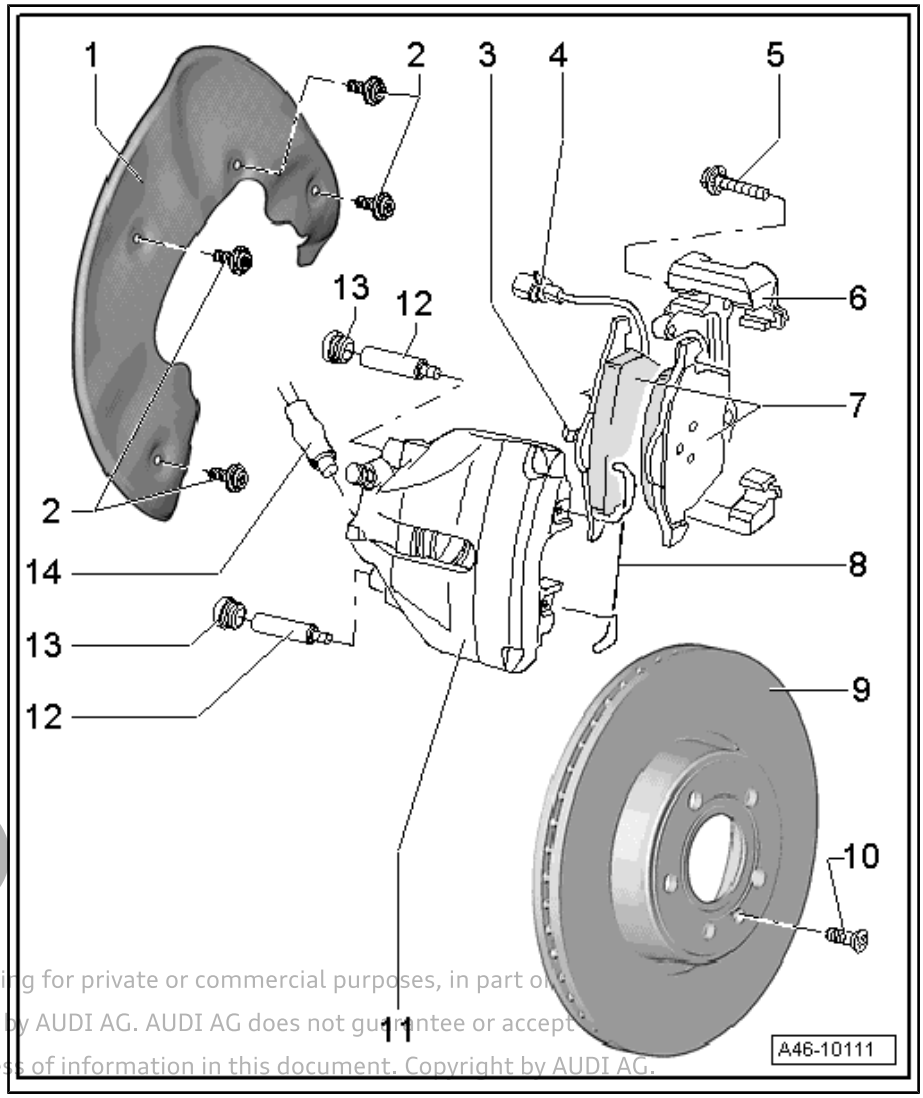
– Fit brake carrier.

– Secure brake carrier with bolts -5-.



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– Connect brake hose to caliper and tighten connection.
– Install brake pads ⇒ page 63 .
– Remove brake pedal actuator - V.A.G 1869/2- .

Note

Only bleed the brakes at the wheel for which the brake caliper is being renewed.

– Bleed brake system (if brake pressure is insufficient) ⇒ page 248 .
– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

Caution

After installing the brake pads and before driving the vehicle, depress brake pedal firmly several times with the vehicle stationary, so that the brake pads are properly seated in their normal operating position.

– Check brake fluid level and top up if necessary.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

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1.4.2 Renewing brake caliper (1LA/1LB/1LJ/ 1LD/1ZT and S4/S5)

Note

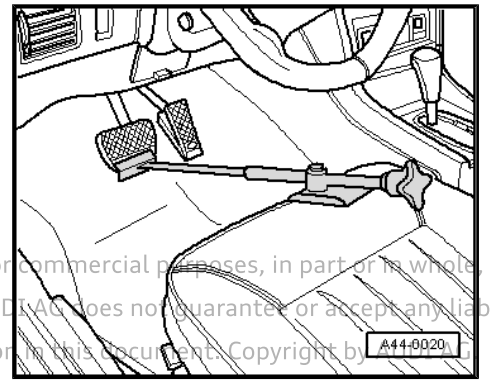
- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

Removing

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-
- Ratchet - V.A.G. 1332/1-
- Torque wrench - V.A.G 1331-
- Ratchet - V.A.G. 1331/1-
- Brake pedal actuator - V.A.G 1869/2-
- Piston resetting appliance - T10145-

– Insert brake pedal actuator -V.A.G 1869/2- between brake pedal and driver's seat (depress brake pedal at least 60mm). This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.



– Raise vehicle.
– Remove wheels.
– Connect hose of bleeder bottle to bleeder screw of front brake caliper.
– Open bleeder screw on front brake caliper to release pressure from brake system.
– Close bleeder screw (15 Nm).

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Note

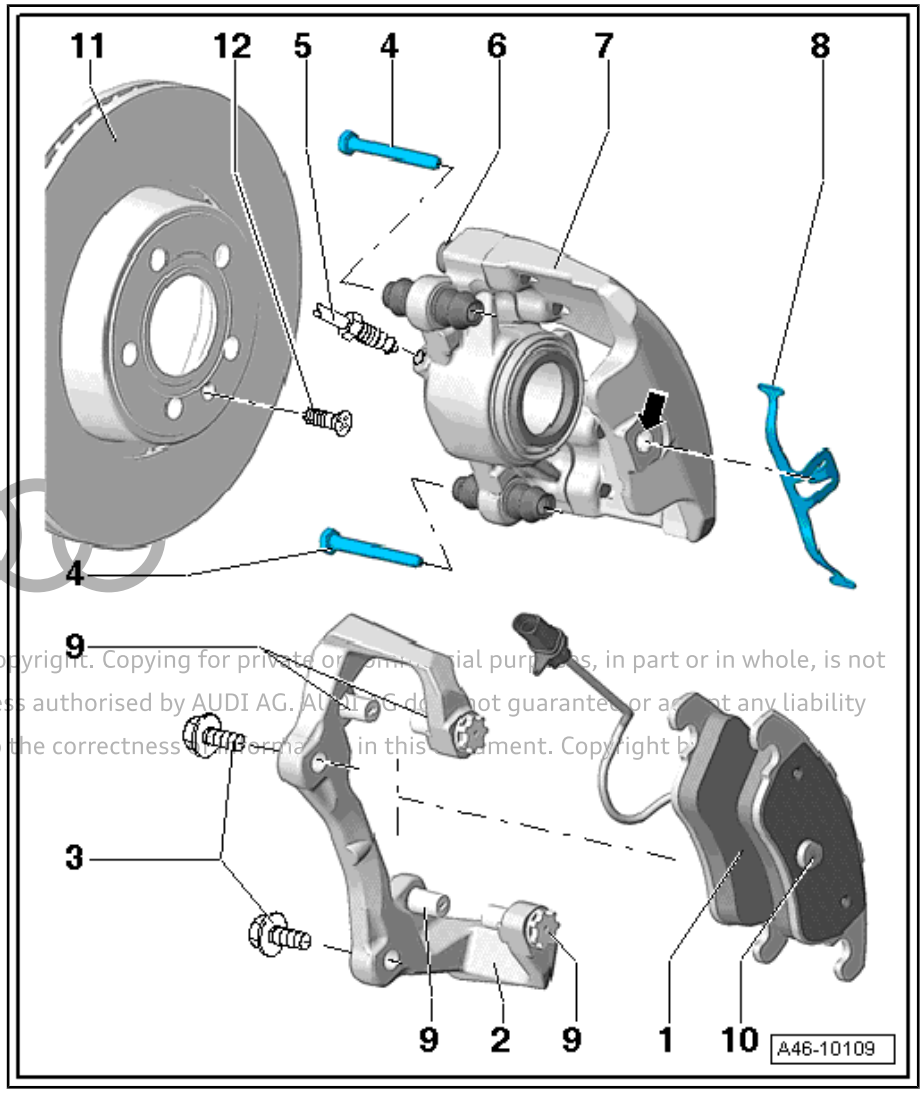
Do not remove brake pedal actuator -V.A.G 1869/2- .

– Disconnect brake pressure line from caliper.
– Remove brake pads ⇒ page 66 .

Note

Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.

– Remove brake caliper -7- from vehicle.



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Caution

Do NOT slacken bolts -6 and 9-

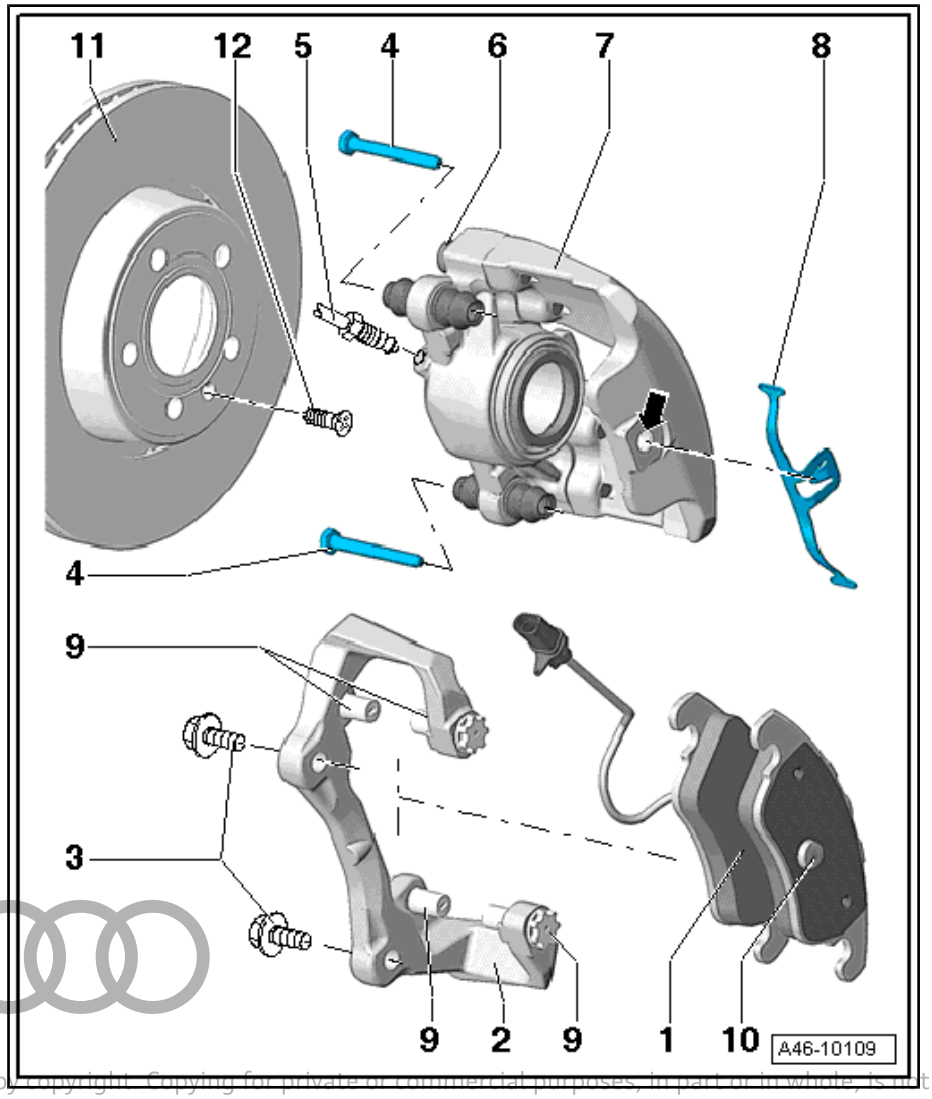
– Remove bolts -3- on brake carrier, holding brake carrier firmly.
– Detach brake carrier.

Installing

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

– Fit brake carrier.
– Secure brake carrier with bolts -3-.



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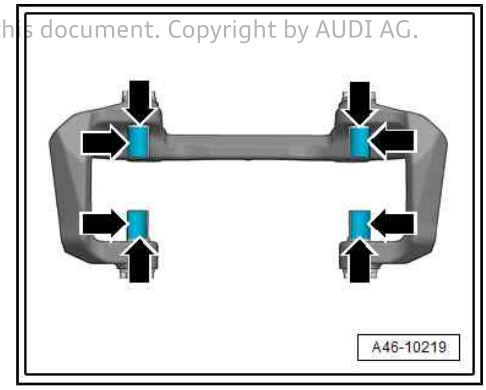
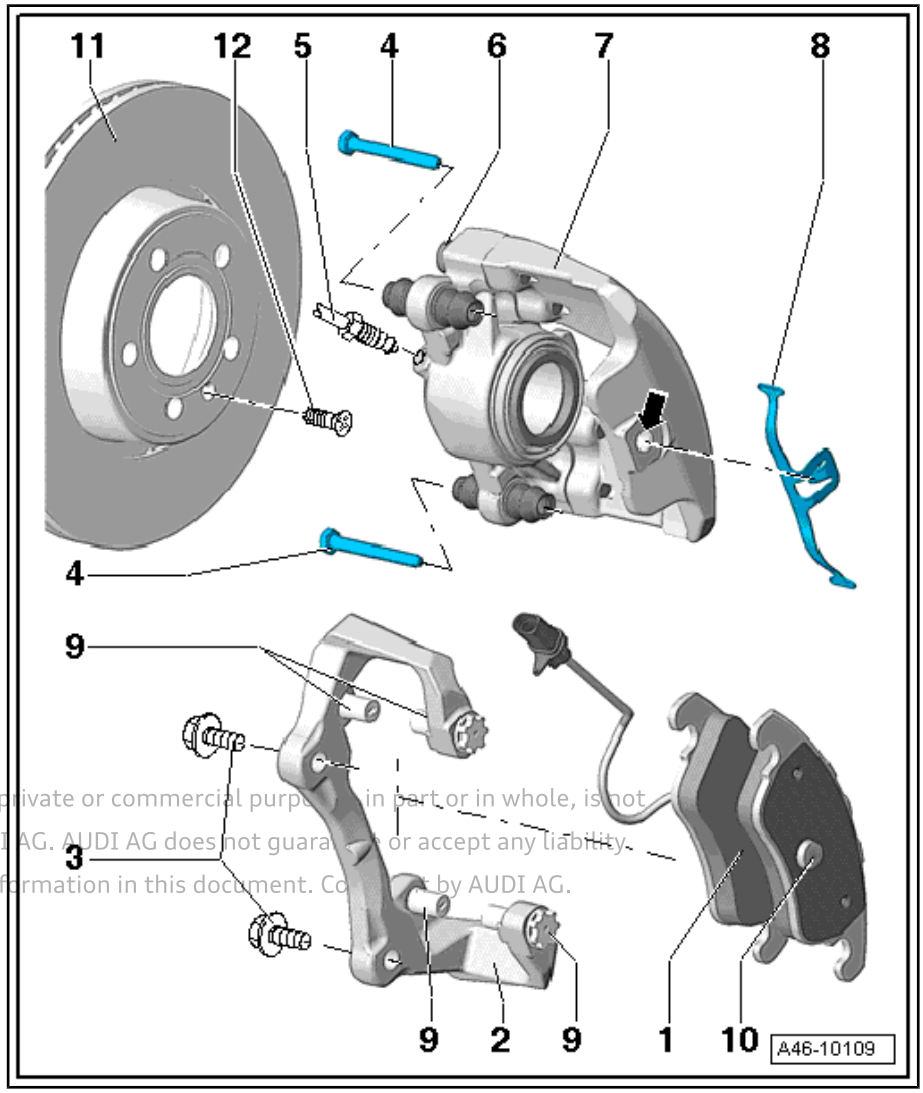
Note

Before fitting brake pads, clean pad retaining pins -arrows- and grease lightly ⇒ ETKA . Ensure that no grease gets onto rubber parts. Clean grease off rubber parts.



– Install brake pads ⇒ page 66 .
– Connect brake pressure line -5- to caliper and tighten connection.



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– Remove brake pedal actuator - V.A.G 1869/2- .

Note

Only bleed the brakes at the wheel for which the brake caliper is being renewed.

– Bleed brake system (if brake pressure is insufficient) ⇒ page 248 .

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

Caution

After installing the brake pads and before driving the vehicle, depress brake pedal firmly several times with the vehicle stationary, so that the brake pads are properly seated in their normal operating position.

– Check brake fluid level and top up if necessary.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.4.3 Renewing brake caliper (1LM)

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

Note

Removing

– Insert brake pedal actuator -V.A.G 1869/2- between brake pedal and driver's seat (depress brake pedal at least 60 mm). This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.

– Raise vehicle.

– Remove wheels.

– Connect hose of bleeder bottle to bleeder screw of front brake caliper.

– Open bleeder screw on front brake caliper to release pressure from brake system.

– Close bleeder screw (15 Nm).

Note

Do not remove brake pedal actuator -V.A.G 1869/2- .

– Remove brake pads ⇒ page 74 .

– Disconnect brake hose -8- from brake caliper.

– Remove bolts -13- (hold brake caliper firmly).

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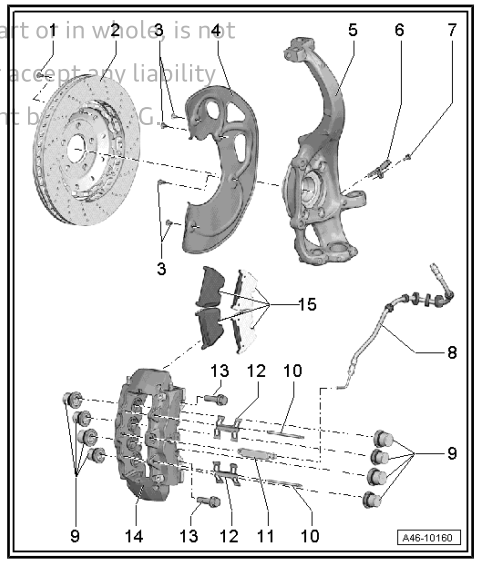
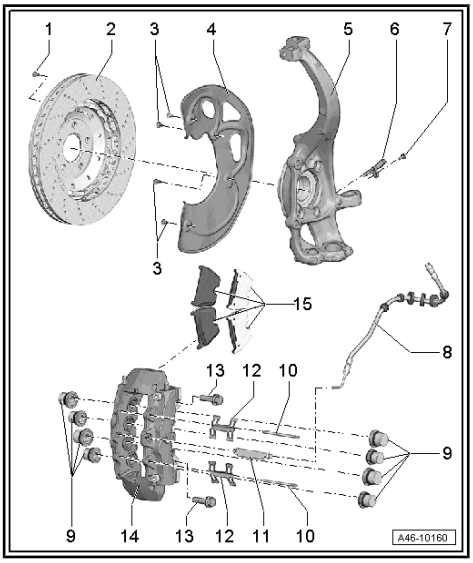
Installing



Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

– Attach brake caliper and secure with bolts -13-.
– Secure brake hose -8- to brake caliper.



Note

- *Brake hose in brake caliper, 16 Nm*
- *Brake pressure line to brake hose: 16 Nm*

– Install brake pads ⇒ page 74 .
– Remove brake pedal actuator - V.A.G 1869/2- .

Note

Only bleed the brakes at the wheel for which the brake caliper is being renewed.

Note

- *Bleed each brake caliper at both bleeder screws.*
- *Tightening torque for bleeder screw: 15 Nm*

– Bleed brake system (if brake pressure is insufficient) ⇒ page 248 .
– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

Caution

Before the vehicle is driven, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

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1.4.4 Renewing brake caliper - ceramic brakes (1LW)

Note

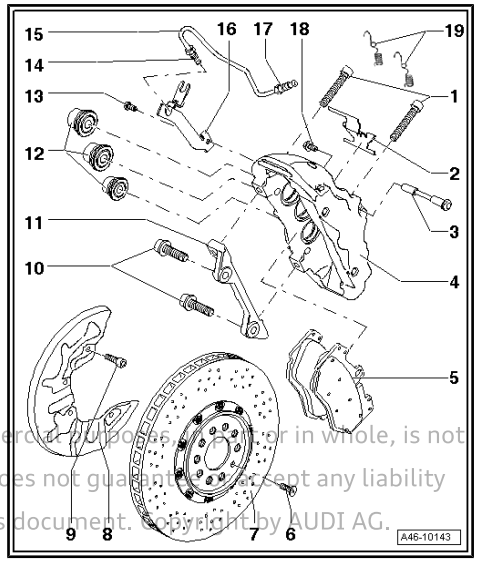
- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

Removing

Note

- *Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.*
- *When installing brake discs, note direction of travel -indicated by arrow on brake disc- and fitting location -left or right-.*

– Raise vehicle.
– Remove wheels.
– Remove brake pads ⇒ page 76 .
– Remove bolts -10-.
– Detach brake caliper.



Installing

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

– Slide brake caliper over brake disc.

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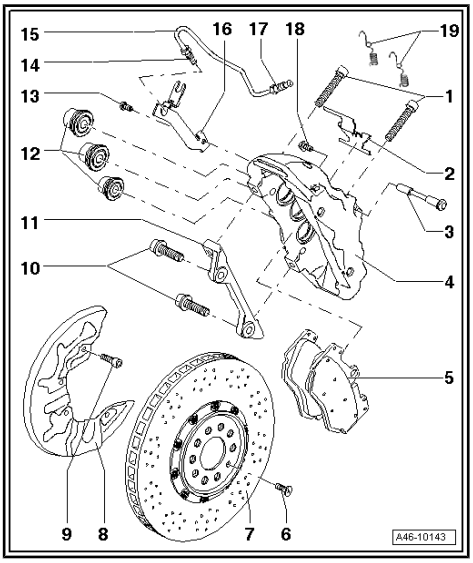
– Screw in bolts -10- and tighten to 196 Nm.
– Install brake pads ⇒ page 76 .
– Remove brake pedal actuator - V.A.G 1869/2- .



Note

Only bleed the brakes at the wheel for which the brake caliper is being renewed.

– Bleed brake system (if brake pressure is insufficient) ⇒ page 248 .
– Install wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts .

Caution

After installing the brake pads and before driving the vehicle, depress brake pedal firmly several times with the vehicle stationary, so that the brake pads are properly seated in their normal operating position.

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– Check brake fluid level and top up if necessary.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.5 Removing and installing brake disc

⇒ "1.5.1 Removing and installing brake disc (1LT/1LY)", page 99

⇒ "1.5.2 Removing and installing brake disc (1LA/1LB/1LJ/1LD/1ZT and S4/S5)", page 100

⇒ "1.5.3 Removing and installing brake disc (1LM)", page 102

⇒ "1.5.4 Removing and installing brake disc - ceramic brakes (1LW)", page 103

1.5.1 Removing and installing brake disc (1LT/1LY)

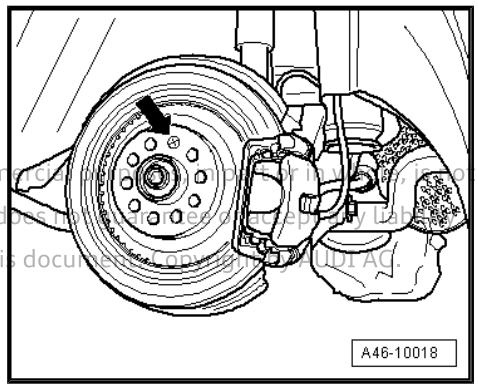
Detaching

– Raise vehicle.
– Remove wheels.
– Detach front brake caliper with pads and brake carrier ⇒ page 80 .

Do not leave brake caliper and brake carrier hanging from brake hose but secure them to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

– Remove locating bolt -arrow- from brake disc, holding brake disc in position.

– Remove brake disc.



Note

Take care to keep the brake disc straight when taking it off the wheel hub.

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Installing

Clean brake disc, wheel hub and contact surfaces before installing.

– Fit brake disc onto wheel hub.

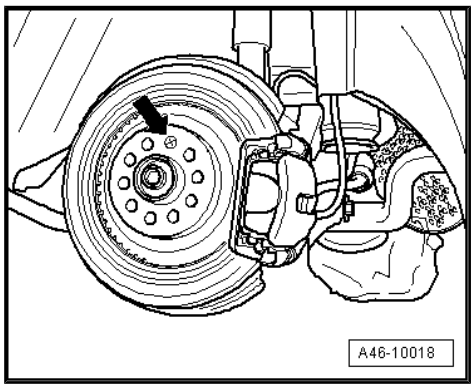
Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.

– Screw in locating bolt -arrow- and tighten.

– Install front brake caliper with pads and brake carrier ⇒ page 80 .

– Fit wheels.



Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

1.5.2 Removing and installing brake disc (1LA/1LB/1LJ/1LD/1ZT and S4/S5)

Detaching

– Raise vehicle.

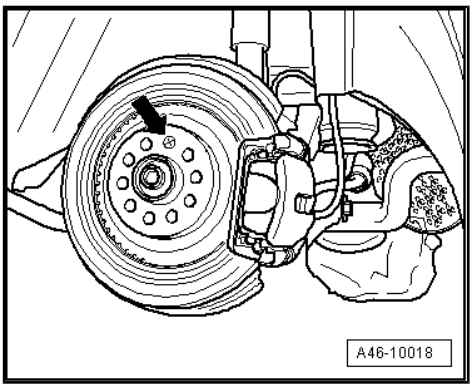
– Remove wheels.

– Detach front brake caliper with pads and brake carrier ⇒ page 83 .

Do not leave brake caliper and brake carrier hanging from brake hose but secure them to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

– Remove locating bolt -arrow- from brake disc, holding brake disc in position.

– Remove brake disc.



Note

Take care to keep the brake disc straight when taking it off the wheel hub.

Installing

Clean brake disc, wheel hub and contact surfaces before installing.

– Fit brake disc onto wheel hub.

Note

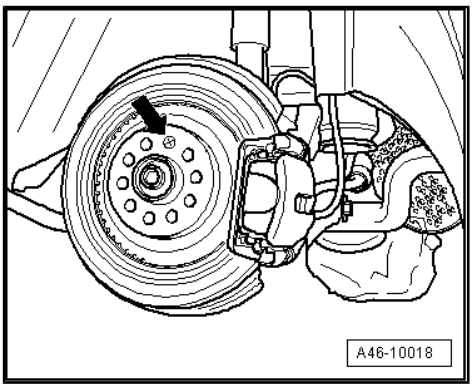
Take care to keep the brake disc straight when fitting it onto the wheel hub.

– Screw in locating bolt -arrow- and tighten.

– Install front brake caliper with pads and brake carrier ⇒ page 83 .

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts



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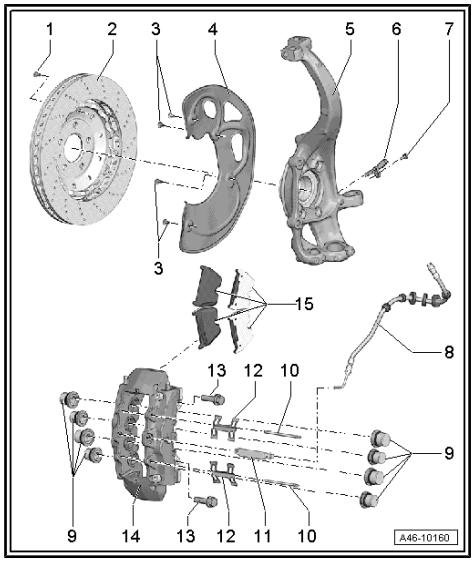
1.5.3 Removing and installing brake disc (1LM)



Note

Renew bolts -1 and 13-.

Detaching

– Raise vehicle.

– Remove wheels.

– Press back brake pads slightly.

The brake pistons can be pressed back by applying commercially available pliers to the old brake pads while they are still fitted so that all of the pistons in the brake caliper are pressed back evenly.

Note

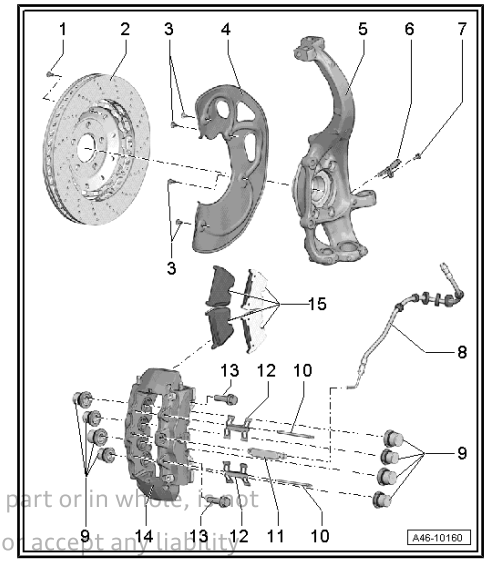
- *Make sure that brake pads and paint on brake caliper are not damaged.*
- *Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if the reservoir has been topped up.*

– Remove brake caliper ⇒ page 84 .

Tie brake caliper up to vehicle using a suitable wire. Take care that brake hose is not damaged by weight of brake caliper.

– Remove locating bolt -1- from brake disc.

– Take brake disc off wheel hub.



Note

Take care to keep the brake disc straight when taking it off the wheel hub.

Installing

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Note

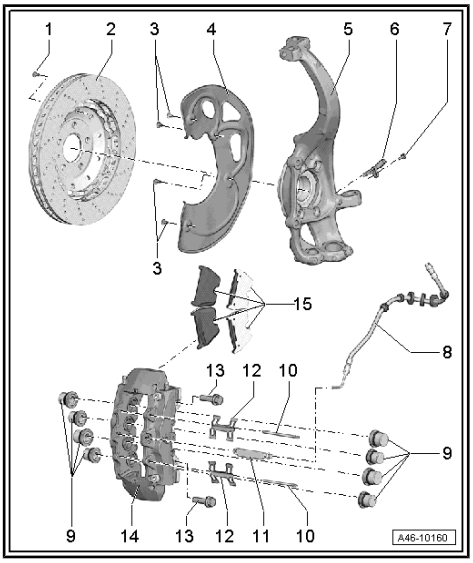
Renew bolts -1 and 13-.

Clean brake disc, wheel hub and contact surfaces before installing.

– Fit brake disc onto wheel hub.

Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.

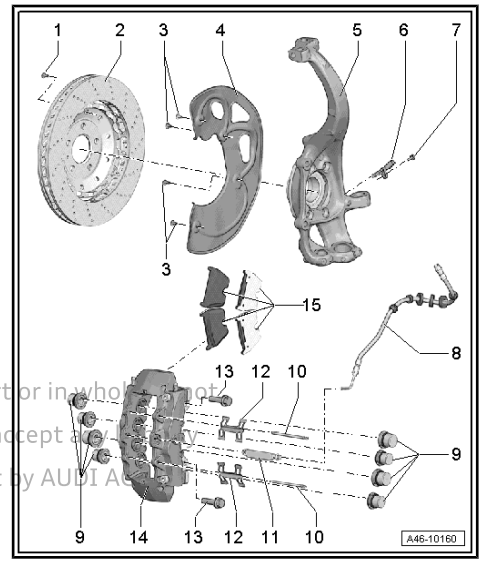


– Screw in locating bolt -1- and tighten to 9 Nm.

– Install brake caliper ⇒ page 84 .

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts



Caution

Before the vehicle is driven, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.

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Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.5.4 Removing and installing brake disc - ceramic brakes (1LW)

WARNING

The brake disc rotor and the brake disc hub are bolted together and must NOT be separated. DO NOT slacken the bolted connection on the brake disc hub.

– Raise vehicle.

– Remove wheels.

Caution

On vehicles with ceramic brakes the wheel must not be allowed to drop onto the brake disc. This would cause irreparable damage to the disc. Screw two assembly pins (from vehicle tool kit) into the wheel bolt holes when removing and fitting a wheel. Insert the long assembly pin into the top hole.

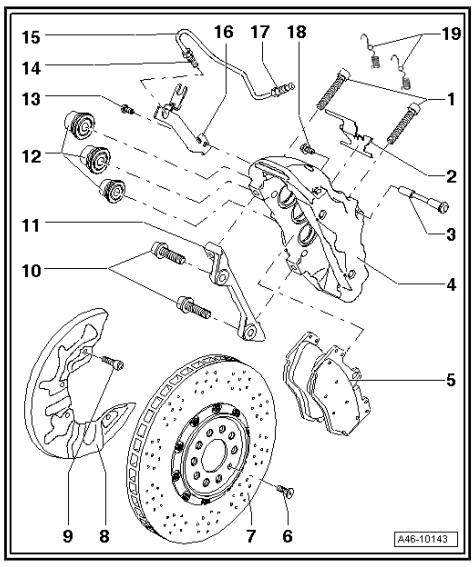
– Detach brake caliper via bolt -10-.

Do not leave brake caliper and brake carrier hanging from brake hose but secure them to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

Note

Do not loosen bolts -1- to remove brake caliper.

– Remove locating bolt -6- from brake disc, holding brake disc in position.
– Take brake disc off wheel hub.



Note

Take care to keep the brake disc straight when taking it off the wheel hub.

Installing

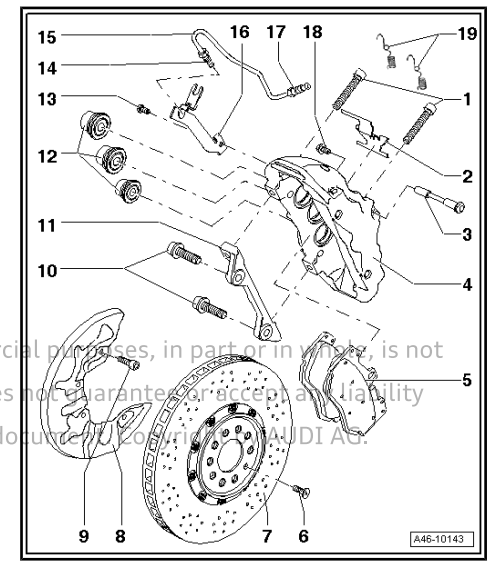
– Clean contact surfaces of wheel hub and brake disc and remove corrosion.
– Fit brake disc onto wheel hub.

Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.

– Screw in locating bolt -6- and tighten to 5 Nm.
– Attach brake caliper.
– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts



Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

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1.6 Renew brake disc

⇒ “1.6.1 Renewing brake disc (1LT/1LY)”, page 105

⇒ “1.6.2 Renewing brake disc (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 109

⇒ “1.6.3 Renewing brake disc (1LM)”, page 113

⇒ “1.6.4 Renewing brake disc for ceramic brakes (1LW)”, page 115

1.6.1 Renewing brake disc (1LT/1LY)

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

Removing

– Raise vehicle.

– Remove wheels.

– Remove front brake pads ⇒ page 63 .

Do not leave brake caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

– Remove bolts -5- on front brake carrier.

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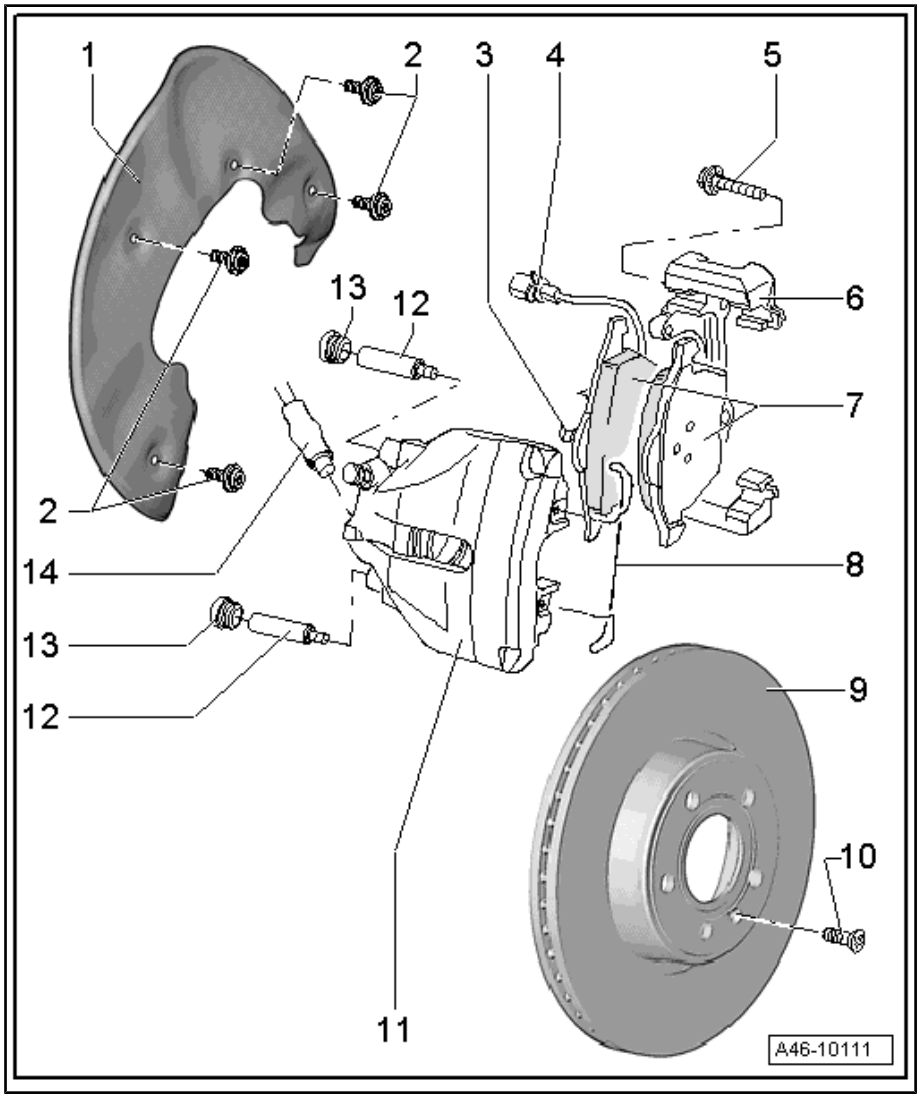

– Detach front brake carrier.

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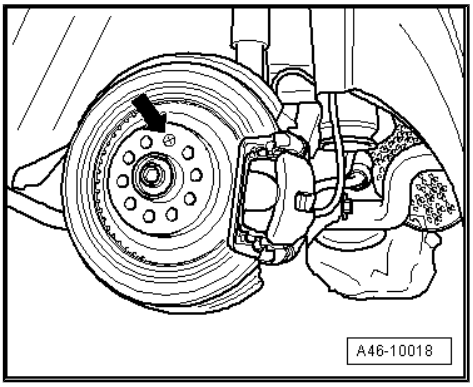
– Remove locating bolt -arrow- from brake disc, holding brake disc in position.
– Remove brake disc.



Note

Take care to keep the brake disc straight when taking it off the wheel hub.

Installing

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

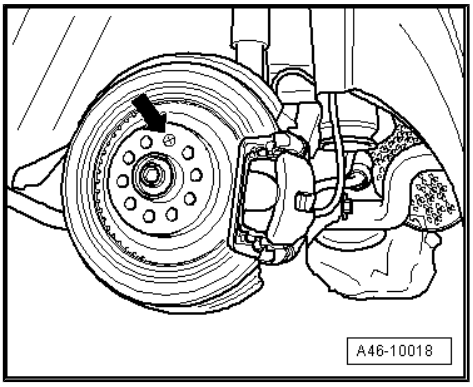
Clean brake disc, wheel hub and contact surfaces before installing.

– Fit brake disc onto wheel hub.

Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.

– Screw in locating bolt -arrow- and tighten.
– Fit front brake carrier.



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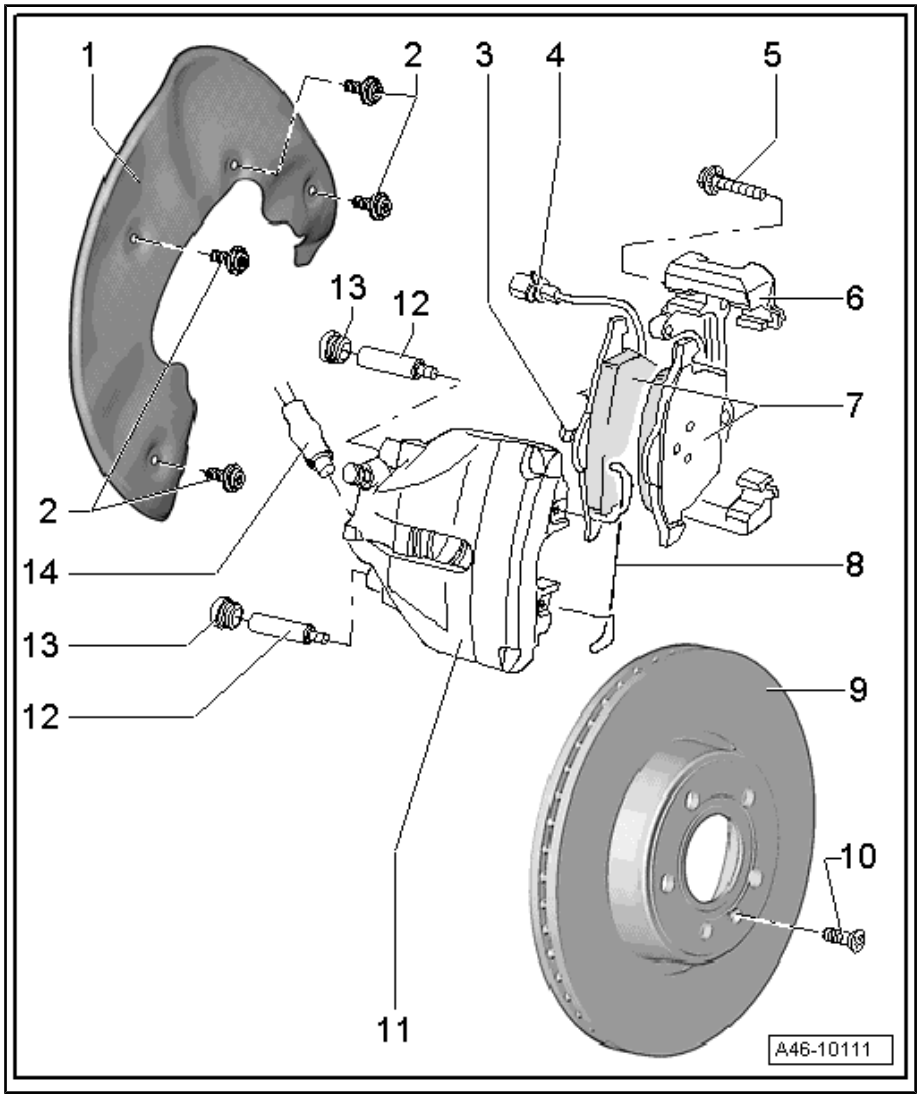

– Fit bolts -5- on front brake carrier and tighten.
– Install front brake pads ⇒ page 63 .

Note

After each brake pad change firmly depress brake pedal several times with vehicle stationary, so that the brake pads are properly seated in their normal operating position.

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

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1.6.2 Renewing brake disc (1LA/1LB/1LJ/ 1LD/1ZT and S4/S5)

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

Removing

– Raise vehicle.

– Remove wheels.

– Remove front brake pads ⇒ page 66 .

Do not leave brake caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

– Remove bolts -3- on front brake carrier.

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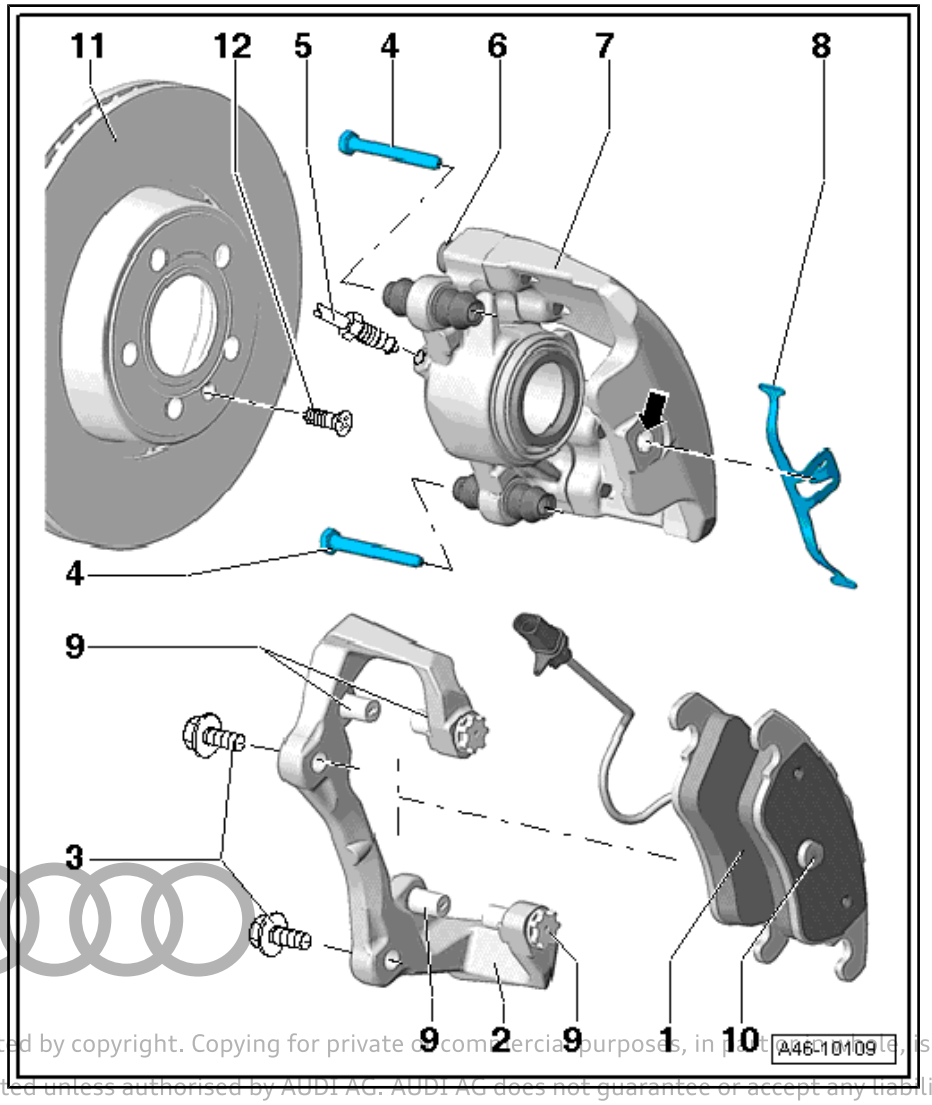

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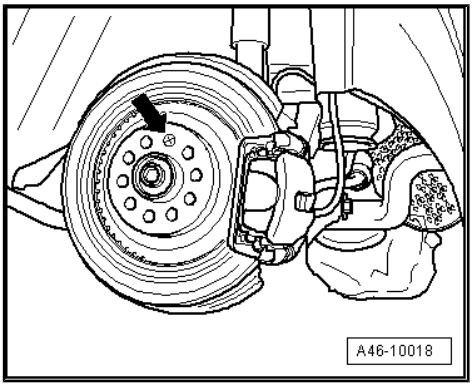
Caution

Do NOT slacken bolts -6 and 9-

– Detach front brake carrier.

– Remove locating bolt -arrow- from brake disc, holding brake disc in position.
– Remove brake disc.



Note

Take care to keep the brake disc straight when taking it off the wheel hub.

Installing

Clean brake disc, wheel hub and contact surfaces before installing.

– Fit brake disc onto wheel hub.

Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.

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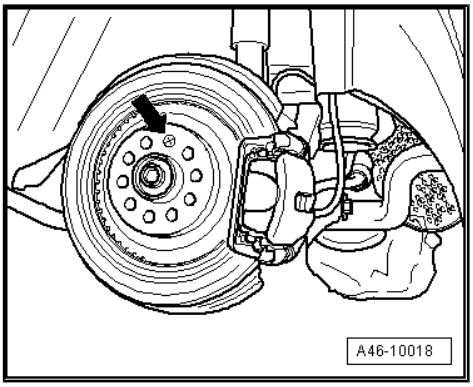
– Screw in locating bolt -arrow- and tighten.
– Fit front brake carrier.



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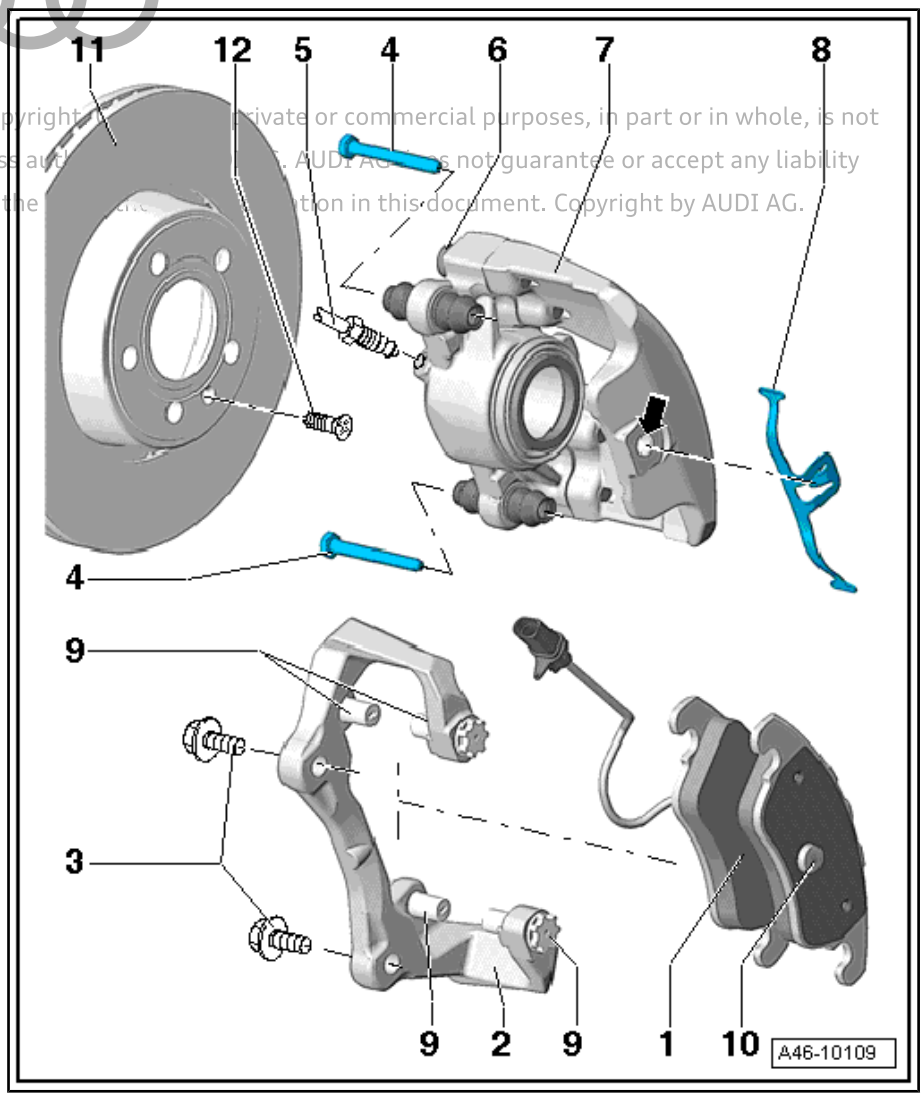
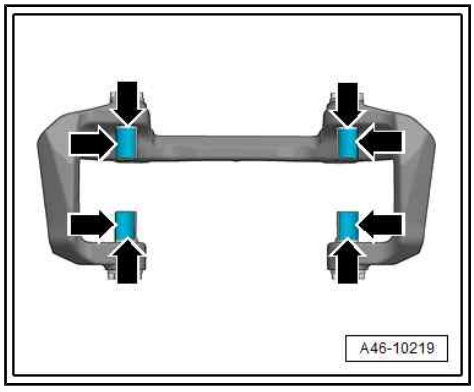


– Fit bolts -3- on front brake carrier and tighten.

Note

Before fitting brake pads, clean pad retaining pins -arrows- and grease lightly ⇒ ETKA . Ensure that no grease gets onto rubber parts. Clean grease off rubber parts.



– Install front brake pads ⇒ page 66 .

Note

After each brake pad change firmly depress brake pedal several times with vehicle stationary, so that the brake pads are properly seated in their normal operating position.

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

1.6.3 Renewing brake disc (1LM)

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

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Note

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

Removing

– Raise vehicle.
– Remove wheels.
– Remove brake pads ⇒ page 74 .
– Remove brake caliper ⇒ page 84 .

Tie brake caliper up to vehicle using a suitable wire. Take care that brake hose is not damaged by weight of brake caliper.

– Remove locating bolt -1- from brake disc.

– Take brake disc off wheel hub.

Note

Take care to keep the brake disc straight when taking it off the wheel hub.

Installing

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

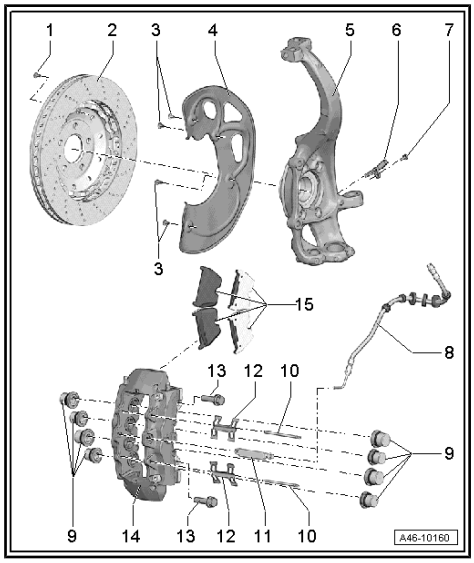
Note

Clean brake disc, wheel hub and contact surfaces with brake cleaner before installing.

– Fit brake disc onto wheel hub.

Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.



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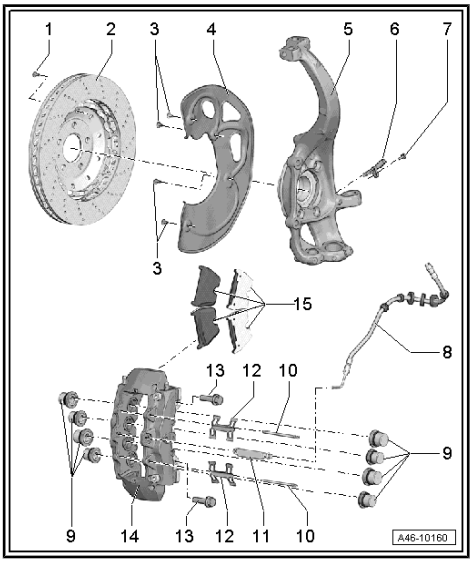

– Screw in locating bolt -1- and tighten to 9 Nm.
– Install brake caliper ⇒ page 84 .
– Install brake pads ⇒ page 74 .

Note

Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

Caution

Before the vehicle is driven, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.

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Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.6.4 Renewing brake disc for ceramic brakes (1LW)

WARNING

The brake disc rotor and the brake disc hub are bolted together and must NOT be separated. DO NOT slacken the bolted connection on the brake disc hub.

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

Removing

– Raise vehicle.
– Remove wheels.

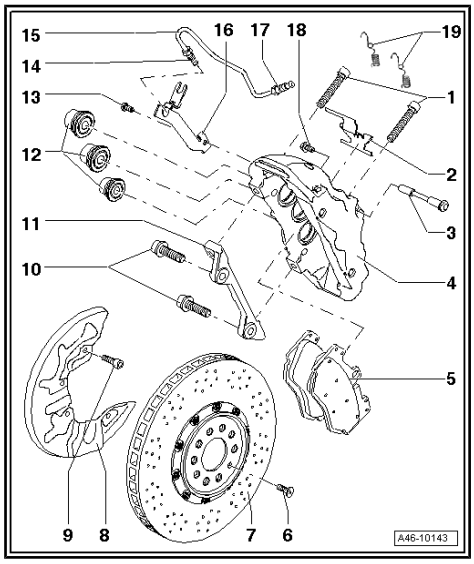
Caution

On vehicles with ceramic brakes the wheel must not be allowed to drop onto the brake disc. This would cause irreparable damage to the disc. Screw two assembly pins (from vehicle tool kit) into the wheel bolt holes when removing and fitting a wheel. Insert the long assembly pin into the top hole.

– Remove brake pads.
– Detach brake caliper.

Do not leave brake caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

– Remove locating bolt -6- from brake disc, holding brake disc in position.
– Take brake disc off wheel hub.



Note

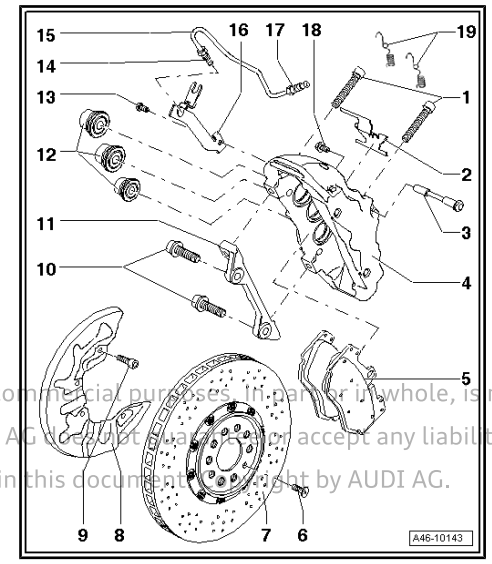
Take care to keep the brake disc straight when taking it off the wheel hub.

Installing

– Clean contact surfaces of wheel hub and remove corrosion.
– Fit brake disc onto wheel hub.

Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.



– Screw in locating bolt -6- and tighten to 5 Nm.
– Attach brake caliper.
– Install brake pads.
– Fit wheels.

Caution

On vehicles with ceramic brakes the wheel must not be allowed to drop onto the brake disc. This would cause irreparable damage to the disc. Screw two assembly pins (from vehicle tool kit) into the wheel bolt holes when removing and fitting a wheel. Insert the long assembly pin into the top hole.

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Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.7 Removing and installing splash plate

⇒ “1.7.1 Removing and installing splash plate (1LT/1LY)”, page 117

⇒ “1.7.2 Removing and installing splash plate (1LA/1LB/1LJ/1LD/1ZT and S4/S5)”, page 118

⇒ “1.7.3 Removing and installing splash plate (1LM)”, page 119

⇒ “1.7.4 Removing and installing splash plate for ceramic brakes (1LW)”, page 120

1.7.1 Removing and installing splash plate (1LT/1LY)

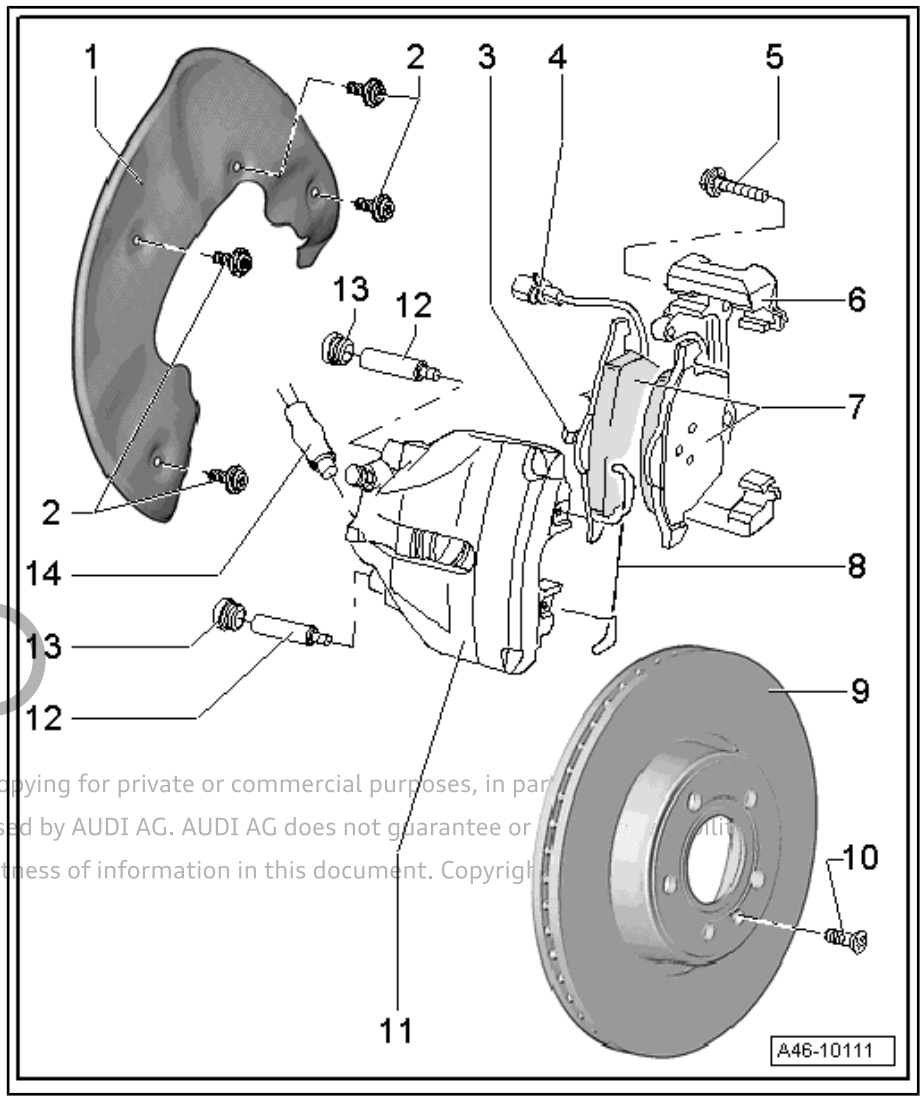
Removing

– Raise vehicle.

– Remove wheels.

– Detach front brake disc ⇒ page 99 .

– Remove bolts -2- from splash plate.



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– Detach splash plate.

Installing

– Installation is carried out in reverse sequence.

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

1.7.2 Removing and installing splash plate (1LA/1LB/1LJ/1LD/1ZT and S4/S5)

Removing

– Raise vehicle.

– Remove wheels.

– Detach front brake disc ⇒ page 100 .

– Remove bolts on splash plate.

– Detach splash plate.

Installing

– Installation is carried out in reverse sequence.

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

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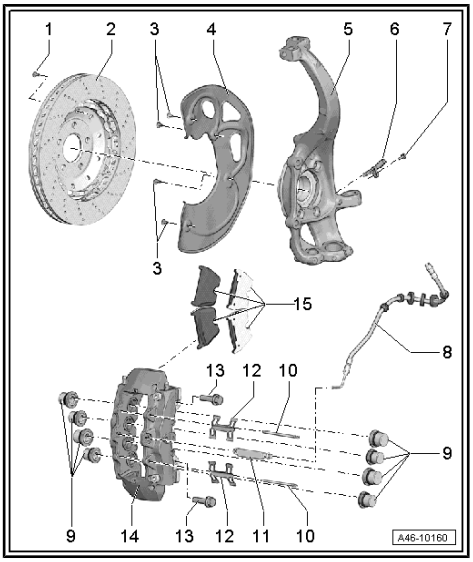
1.7.3 Removing and installing splash plate (1LM)



Note

Renew bolts -1 and 13-.

Removing

– Raise vehicle.

– Remove wheels.

– Press back brake pads slightly.

The brake pistons can be pressed back by applying commercially available pliers to the old brake pads while they are still fitted so that all of the pistons in the brake caliper are pressed back evenly.

Note

- *Make sure that brake pads and paint on brake caliper are not damaged.*
- *Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if the reservoir has been topped up.*

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– Remove brake caliper ⇒ page 84 .

– Remove brake disc ⇒ page 102 .

– Remove bolts -3- from splash plate.

– Detach splash plate.

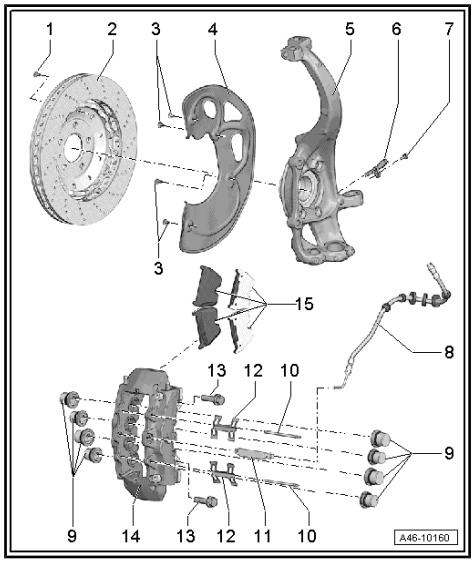
Installing

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

– Secure splash plate with bolts -3- (9 Nm).
– Install brake disc ⇒ page 102 .

Renew bolts -1 and 13-.



Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.

– Tighten locating bolt -1- for brake disc to 9 Nm.
– Install brake caliper ⇒ page 84 .
– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

Caution

Before the vehicle is driven, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.7.4 Removing and installing splash plate for ceramic brakes (1LW)

Removing

– Raise vehicle.
– Remove wheels.
– Press back brake pads slightly.

The brake pistons can be pressed back by applying commercially available pliers to the old brake pads while they are still fitted so that all of the pistons in the brake caliper are pressed back evenly.

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Note

- *Make sure that brake pads and paint on brake caliper are not damaged.*
- *Before pressing the piston back, draw off brake fluid from the reservoir with a bleeder bottle. Otherwise, fluid can overflow and cause damage, particularly if the reservoir has been topped up.*

– Remove brake caliper ⇒ page 85 .

WARNING

Handle brake disc with care. The brake disc must be renewed if it is damaged.

Do not use force when taking brake disc off wheel hub.

– Remove brake disc ⇒ page 103 .
– Remove bolts -9- from splash plate.
– Detach splash plate.

Installing

– Secure splash plate -8- with bolts -9- (9 Nm).

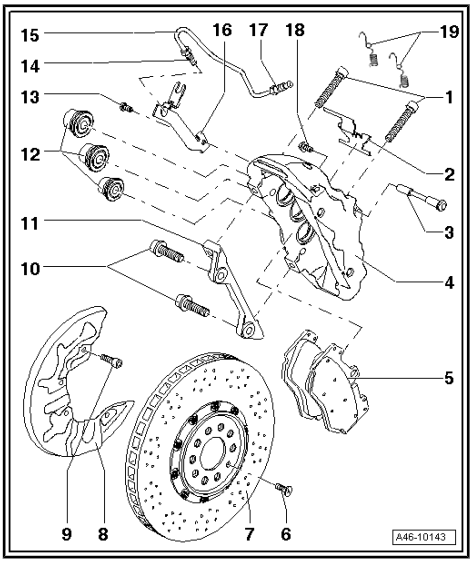
WARNING

Handle brake disc with care. The brake disc must be renewed if it is damaged.

Do not use force when attaching brake disc to wheel hub.

– Install brake disc ⇒ page 103 .

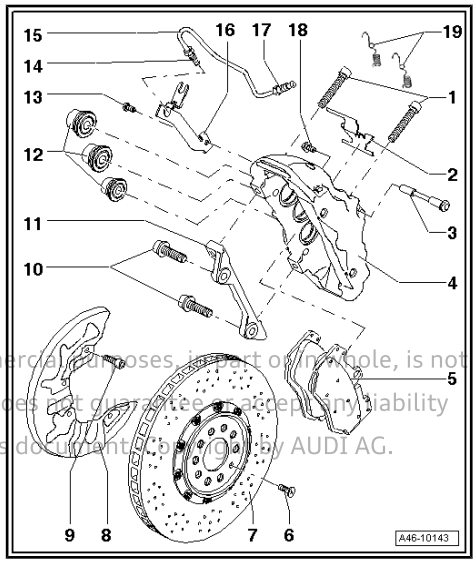
Renew bolts.



Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.

– Tighten locating bolt -6- for brake disc.
– Install brake caliper ⇒ page 85 .
– Install wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts .
– Check brake fluid level and top up if necessary.



Caution

Before the vehicle is driven, depress brake pedal firmly several times with vehicle stationary so that the pads are properly seated in their normal operating position.

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Caution

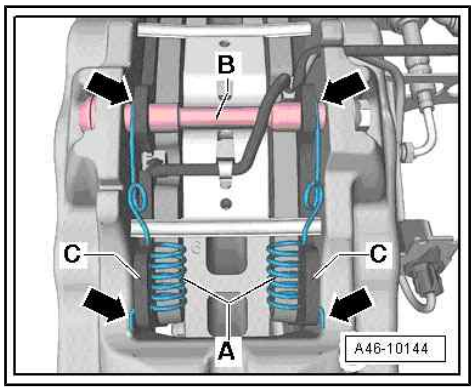
Make sure that the brakes work properly before the vehicle is driven on the road.

1.8 Detaching and attaching damper spring

Detaching

– First disengage springs -A- (left and right) from guide pin -B- using commercially available pliers.

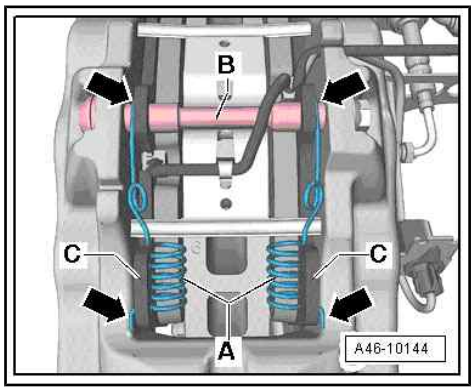
– Then pull springs -A- out of brake pads -C-.



Attaching

– First engage springs -A- (left and right) in bottom hole in corresponding brake pads -C-.

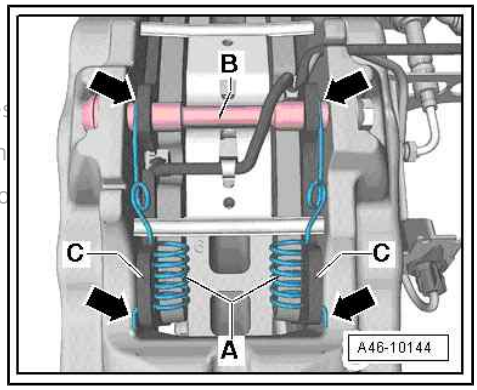
– Then engage springs (left and right) in guide pin -B- using commercially available pliers.



Caution

Make sure that the springs are fitted correctly at the guide pin and brake pads -arrows-.

Note correct position of springs -arrows-.



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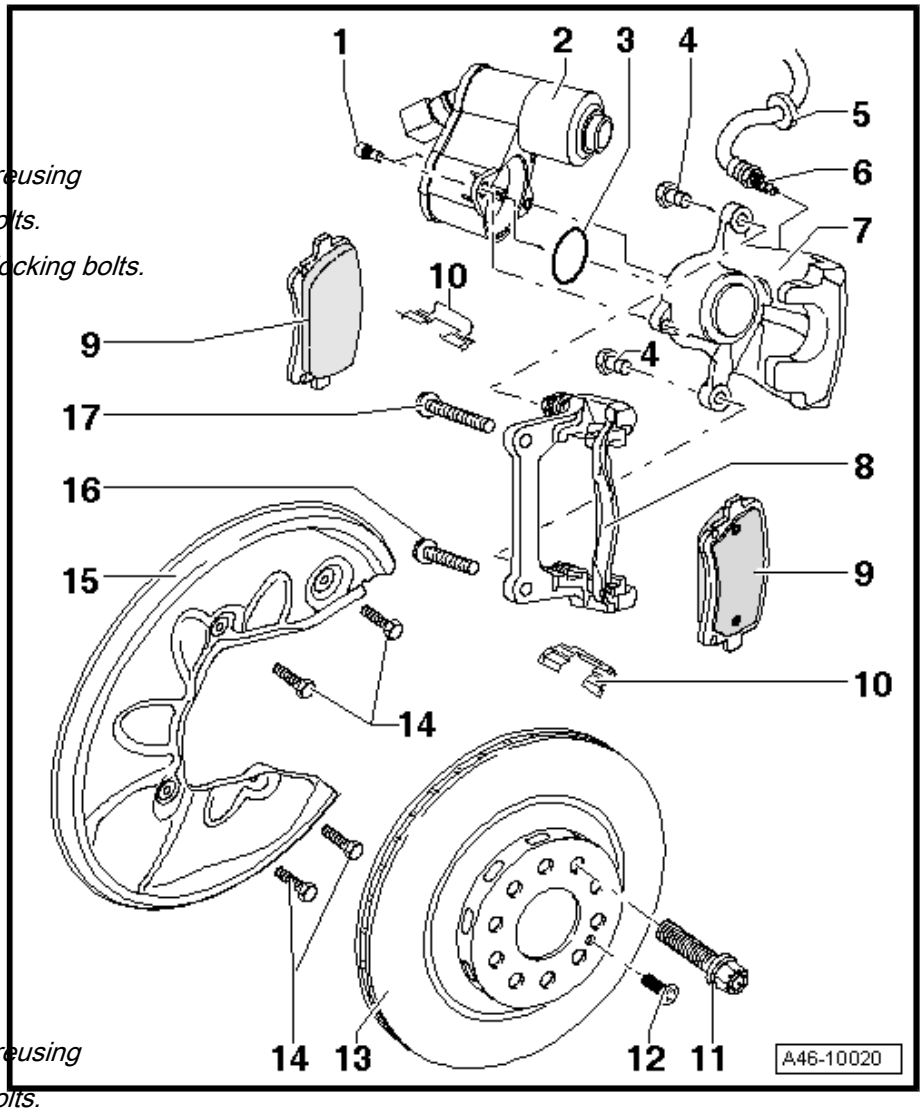
2 Rear brakes

⇒ “2.1 Exploded view - rear brakes”, page 123
⇒ “2.2 Removing and installing brake pads”, page 125
⇒ “2.3 Removing and installing brake caliper”, page 129
⇒ “2.4 Renewing brake caliper”, page 132
⇒ “2.5 Removing and installing brake disc”, page 136
⇒ “2.6 Renew brake disc”, page 137
⇒ “2.7 Removing and installing splash plate”, page 139
⇒ “2.8 Removing and installing splash plate - front-wheel drive vehicles”, page 140

2.1 Exploded view - rear brakes

Note

Install all parts supplied in repair kit.



1 - Self-locking bolt

- ❑ 12 Nm

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

2 - Actuator motor for electronic parking brake and handbrake

- ❑ ⇒ “3.2 Removing and installing control unit for electromechanical parking brake J540 ”, page 142
- ❑ ⇒ “3.3 Removing and installing parking brake motor V282 / V283 ”, page 143

3 - Seal

- ❑ Always renew

4 - Self-locking bolt

- ❑ 35 Nm
- ❑ Always renew
- ❑ Counter-hold guide pin when loosening and tightening

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*

♦ *Always renew self-locking bolts.*

5 - Spacer

6 - Brake hose

- ❑ To brake caliper, 20 Nm
- ❑ Do not disconnect brake line when changing brake pads
- ❑ Make sure that the locking lugs are fitted properly in the bracket
- ❑ Do not twist hose when installing

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7 - Brake caliper housing

- ❑ Do not disconnect brake hose when changing brake pads
- ❑ Servicing brake calipers
- ❑ The brake carrier can be mounted together with the brake caliper
- ❑ ⇒ “2.3 Removing and installing brake caliper”, page 129
- ❑ ⇒ “2.4 Renewing brake caliper”, page 132

8 - Brake carrier with guide pins and protective caps

- ❑ Replacement carriers are supplied assembled and with sufficient grease on guide pins
- ❑ If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate guide pins.
- ❑ The brake carrier can be mounted together with the brake caliper
- ❑ Detaching and attaching ⇒ page 129

9 - Brake pads

- ❑ Always renew on both sides of axle
- ❑ ⇒ “2.2 Removing and installing brake pads”, page 125
- ❑ Checking pad thickness ⇒ Maintenance ; Booklet 8K
- ❑ The brake carrier can be mounted together with the brake caliper

Note

The brake pads must be seated between the two retaining lugs on the pad retainer to help maintain the required clearance between pads and disc

10 - Pad retainer

- ❑ Always renew when changing pads

Note

The brake pads must be seated between the two retaining lugs on the pad retainer to help maintain the required clearance between pads and disc

11 - Wheel bolts

- ❑ Install wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts .

12 - Bolt

- ❑ 5 Nm

13 - Brake disc

- ❑ Wear limit ⇒ page 1
- ❑ ⇒ “2.5 Removing and installing brake disc”, page 136
- ❑ ⇒ “2.6 Renew brake disc”, page 137

WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

14 - Hexagon bolts

- ❑ 10 Nm

15 - Splash plate for brakes

- ❑ ⇒ “2.7 Removing and installing splash plate”, page 139

16 - Bolt

- ❑ 100 Nm + 90°

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Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

17 - Bolts

- ❑ 100 Nm + 90°

Note

- ♦ *Clean bolts before reusing*
- ♦ *Renew damaged bolts.*
- ♦ *Always renew self-locking bolts.*

Note

Tighten bleeder screw to 13 Nm.

2.2 Removing and installing brake pads

When renewing the brake pads, also check the brake disc thickness. Refer to wear limit for brake discs ⇒ page 1 .

Special tools and workshop equipment required

- ♦ Torque wrench - V.A.G 1331-
- ♦ Tool insert - V.A.G 1331/3-

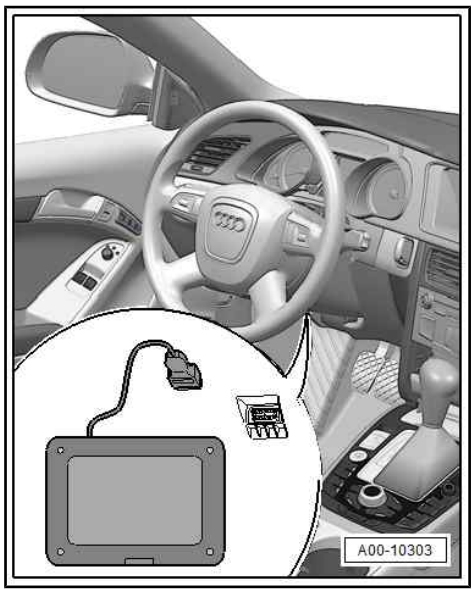
- Vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052-

Removing

Note

- *Mark brake pads when removing them if they are to be reinstalled. Fit in same position when installing otherwise uneven braking will be caused.*
- *It is recommended to apply the electronic parking brake again after driving long distances.*
- *The clearance between brake disc and brake pad is adjusted automatically approx. every 1000 km, unless the EPB is operated while covering this distance.*

– With ignition switched off, connect vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052- to diagnostic connection in vehicle.



Note

- *Switch on ignition.*
- *Release parking brake.*
- *Coding checked and rectified if necessary*
- *Event memory interrogated, indicated faults eliminated and memory erased.*

– Move brake piston back. To do so, select required functions on vehicle diagnostic and service information system - VAS 5051B- .
– Switch off ignition.
– Raise vehicle.
– Remove wheels.
– Unclip brake hose and electrical wire from retainer on hub carrier.

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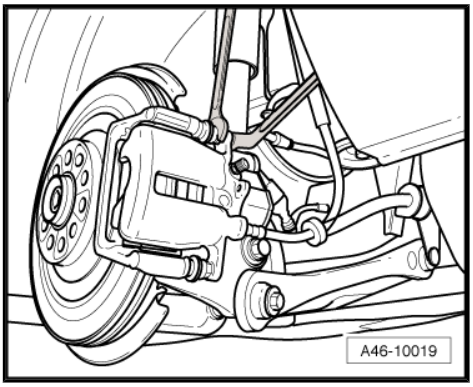
– Remove securing bolts from brake caliper housing, when doing this counter-hold on guide pins.



Note

- *Do not unplug connection of actuator motor or brake system, otherwise a fault will be registered in the memory.*
- *Do not apply tension on brake hose or electrical wiring.*

– Detach brake caliper.

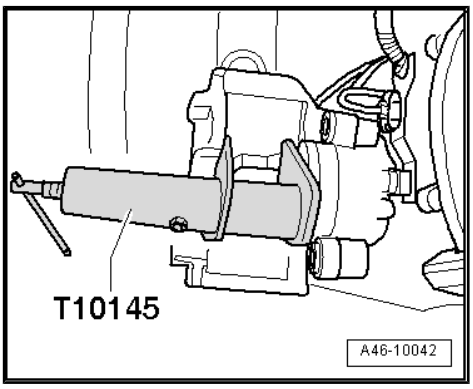
Do not leave brake caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

WARNING

Do not apply brake when brake caliper is removed.

– Remove brake pads.
– Remove pad retainers.
– Press piston back.

Use piston resetting appliance T10145.



Make sure that the brake piston remains straight when it is pressed back.

Use only methylated spirits to clean the brake caliper housing.

Installing

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

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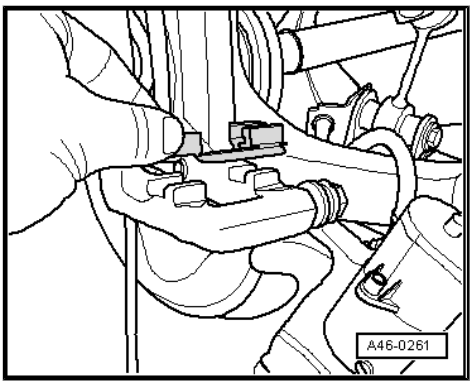
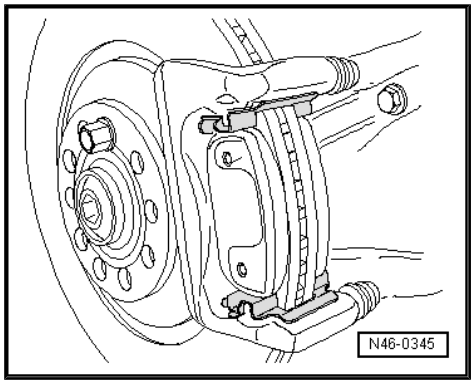
When renewing the brake pads, also check the brake disc thickness. Refer to wear limit for brake disc.

– Check brake disc for wear; wear limit ⇒ page 1 .

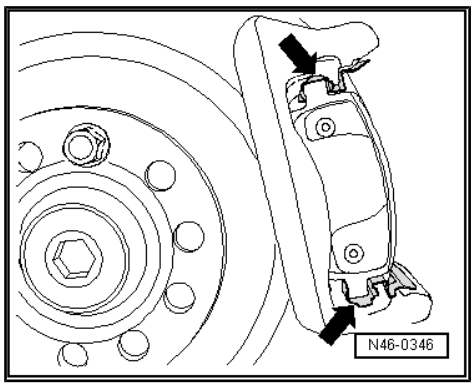
– Insert pad retaining springs.
– If fitted, pull protective foil off pad backplates.



– Fit brake pads.



– Ensure that the brake pads are located correctly in the pad retainers -arrows-.



Note

The brake pads must be seated between the two retaining lugs on the pad retainer to help maintain the required clearance between pads and disc.

– Install brake caliper.

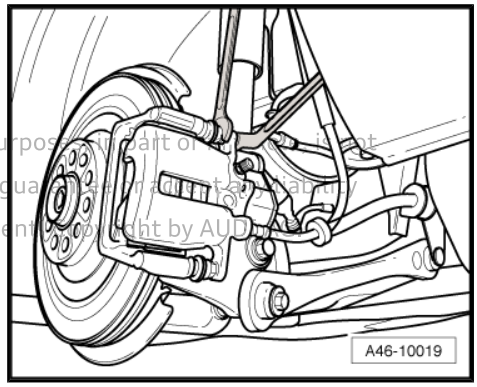
Note

The repair kit includes new self-locking bolts which must be installed in all cases.

– Secure brake caliper with new self-locking bolts.

Use torque wrench - V.A.G 1331- with ring spanner insert - V.A.G 1331/3- to tighten bolts.

– Clip brake hose and electrical wire into retainer on hub carrier.



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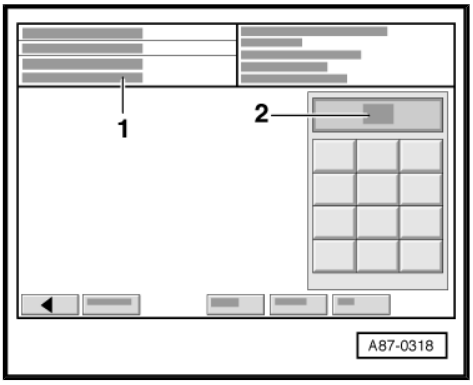
Note

Make sure that brake hose is properly clipped into retainer on hub carrier and securely seated. Otherwise, there is a risk that the brake hose will not remain in the retainer.

– Switch on ignition.

Display on vehicle diagnosis and service information system



- The prompt to enter a display group appears in display zone -1-.
- Display zone -2- shows a keypad.

– Enter “006” as “display group number” via the keypad in display zone -2- and confirm entry with the “Q” key (moves piston to original position).

– Press the green arrow button (bottom left) to exit from the input mask.

Note

Event memory interrogated, indicated faults eliminated and memory erased.

– With ignition switched off, disconnect vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052- from diagnostic connection in vehicle.

– Install wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts .

– Check brake fluid level and top up if necessary.

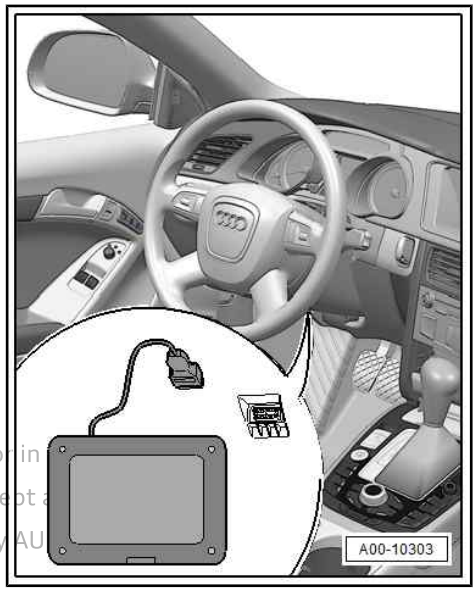
2.3 Removing and installing brake caliper

Detaching

Special tools and workshop equipment required

- Torque wrench - V.A.G 1332-
- Ratchet - V.A.G. 1332/1-
- Vehicle diagnostic, testing and information system - VAS 5051B-
- Ratchet adapter

– With ignition switched off, connect vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052- to diagnostic connection in vehicle.



Note

- *Switch on ignition*
- *Release parking brake.*
- *Coding checked and rectified if necessary*
- *Event memory interrogated, indicated faults eliminated and memory erased.*

– Enter “address word 053” for parking brake.

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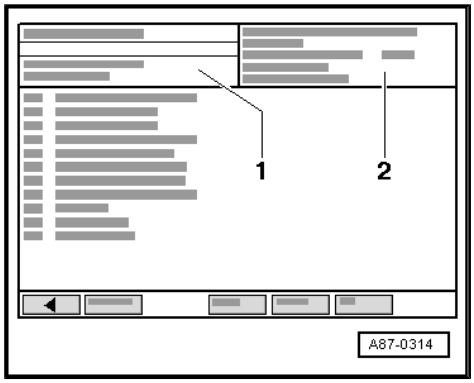
Display on vehicle diagnosis and service information system

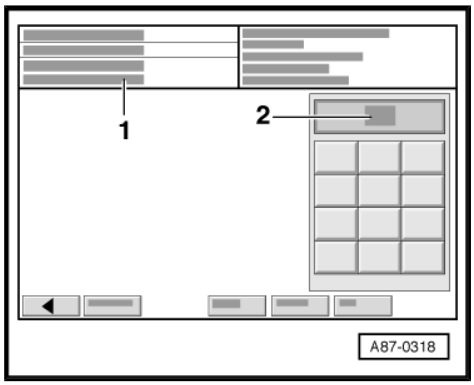
– Select function “053 - Parking brake”.
– Select function “006 - Basic setting”.



Display on vehicle diagnosis and service information system

- The prompt to enter a display group appears in display zone -1-.
- Display zone -2- shows a keypad.

– Enter “7” as “display group number” via the keypad in display zone -2- and confirm entry with the "Q key" (resetting piston).
– Press the green arrow button (bottom left) to exit from the input mask.
– Switch off ignition.
– Raise vehicle.
– Remove wheels.
– Unclip brake hose and electrical wire from retainer on hub carrier.



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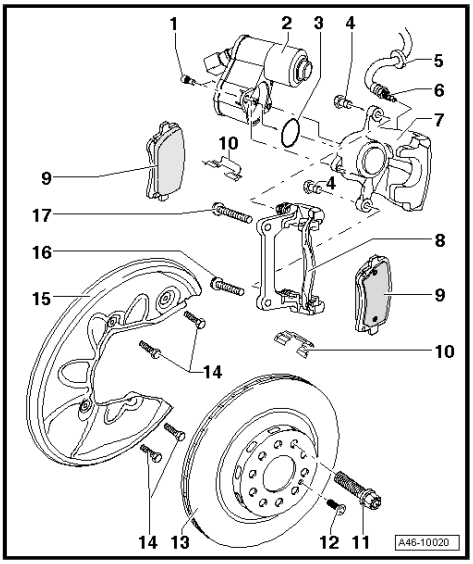
– Remove bolts -16 and 17- on brake carrier.

– Detach brake caliper with pads and brake carrier.

Do not leave brake caliper and brake carrier hanging from brake hose but secure them to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.



WARNING

Do not press the footbrake or apply the electronic parking brake when the brake caliper is removed.

Installing

Note

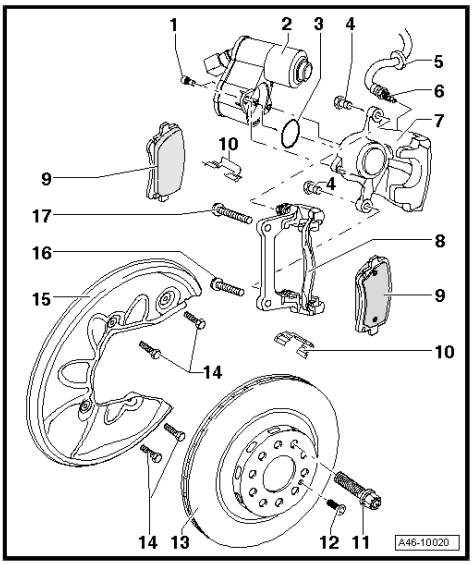
- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

– Carefully press brake caliper and brake carrier (with brake pads fitted) over brake disc.

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

– Secure brake carrier with bolts -16 and 17-.



Note

Use extension (commercially available) to tighten bottom bolt -16-. Top bolt -17- can be tightened without extension. Wheel housing liner must be slightly pressed aside.

– Clip brake hose and electrical wire into retainer on hub carrier.

Note

Make sure that brake hose is properly clipped into retainer on hub carrier and securely seated. Otherwise, there is a risk that the brake hose will not remain in the retainer.

– Fit wheels.

– Lower vehicle.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Switch on ignition.

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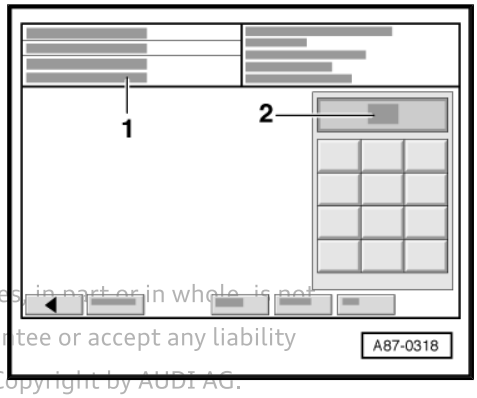
Display on vehicle diagnosis and service information system



- The prompt to enter a display group appears in display zone -1-.
- Display zone -2- shows a keypad.

– Enter “006” as “display group number” via the keypad in display zone -2- and confirm entry with the “Q” key (moves piston to original position).

– Press the green arrow button (bottom left) to exit from the input mask.

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Note

Event memory interrogated, indicated faults eliminated and memory erased.

– With ignition switched off, disconnect vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052- from diagnostic connection in vehicle.

2.4 Renewing brake caliper

Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

Note

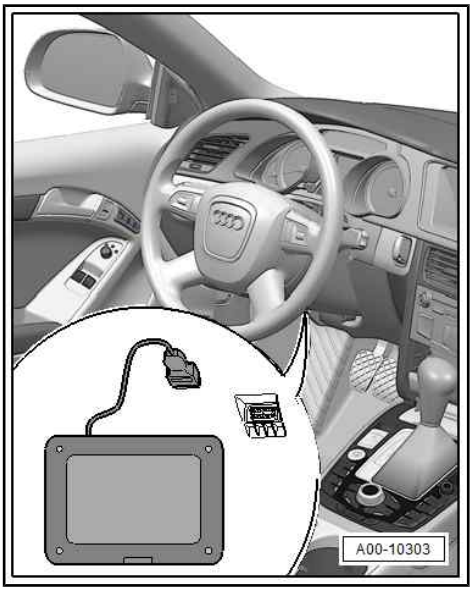
The actuator motor does not have to be removed when renewing the rear brake caliper. The new brake caliper is supplied complete with a new actuator motor.

Removing

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Ring spanner insert - V.A.G. 1331/3-
- Brake pedal actuator - V.A.G 1869/2-
- Vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052-

– With ignition switched off, connect vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052- to diagnostic connection in vehicle.



Note

- *Switch on ignition.*
- *Release parking brake.*
- *Coding checked and rectified if necessary*
- *Event memory interrogated, indicated faults eliminated and memory erased.*

– Select required functions on vehicle diagnostic, testing and information system - VAS 5051B- .

– Switch off ignition.

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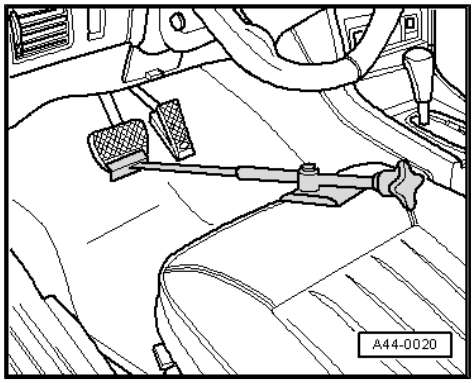
- Insert brake pedal actuator -V.A.G 1869/2- between brake pedal and driver's seat (depress brake pedal at least 60 mm). This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.
- Raise vehicle.
- Remove wheels.
- Connect the hose of a bleeder bottle to one bleeder screw of rear brake caliper.
- Open bleeder screw on rear brake caliper to release pressure from brake system.
- Close bleeder screw (13 Nm).



Note

Do not remove brake pedal actuator -V.A.G 1869/2- .

- Unplug electrical connector for parking brake.
- Unclip brake hose and electrical wire from retainer on hub carrier.
- Remove rear brake pads ⇒ page 125 .

Note

- *Mark brake pads when removing them if they are to be reinstalled. Fit in same position when installing otherwise uneven braking will be caused.*
- *It is recommended to apply the electronic parking brake again after driving long distances.*
- *The clearance between brake disc and brake pad is adjusted automatically approx. every 1000 km, unless the EPB is operated while covering this distance.*

- Disconnect brake pressure line from caliper.
- Remove brake caliper from vehicle.

Note

The actuator motor does not have to be removed when renewing the rear brake caliper. The new brake caliper is supplied complete with a new actuator motor.

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Installing

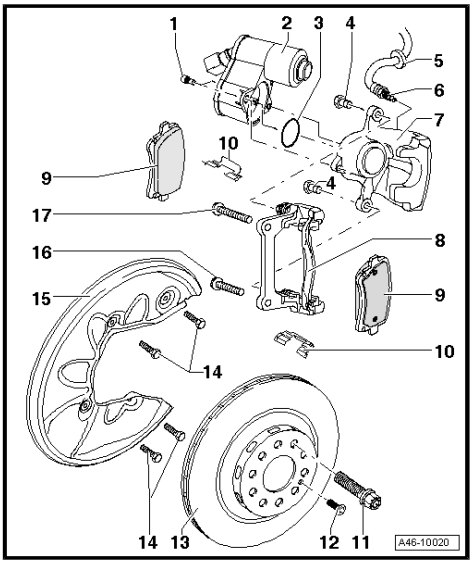
Note

- *Clean bolts before reusing*
- *Renew damaged bolts.*
- *Always renew self-locking bolts.*

- Connect brake pressure line to caliper and tighten connection.
- Install rear brake pads ⇒ page 125 .

– Tighten bolts -4- to secure brake caliper.

Use torque wrench - V.A.G 1331- with ring spanner insert - V.A.G 1331/3- to tighten bolts -4-.



Note

Do not attach electrical connector for parking brake until after tightening bolts.

– Plug in electrical connection for parking brake.

– Clip brake hose and electrical wire into retainer on hub carrier.

Note

Make sure that brake hose is properly clipped into retainer on hub carrier and securely seated. Otherwise, there is a risk that the brake hose will not remain in the retainer.

– Remove brake pedal actuator - V.A.G 1869/2- .

Note

Only bleed the brakes at the wheel for which the brake caliper is being renewed.

– Bleed brake system (if brake pressure is insufficient) ⇒ page 248 .

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Lower vehicle.

– Switch on ignition.

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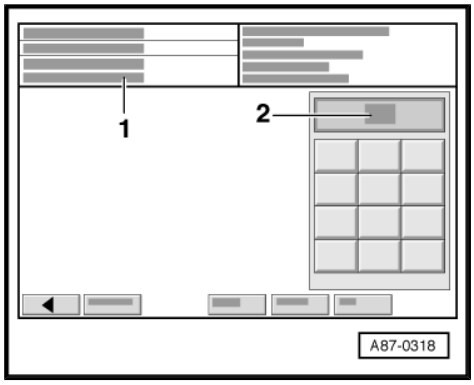
Display on vehicle diagnosis and service information system

- The prompt to enter a display group appears in display zone -1-.
- Display zone -2- shows a keypad.

– Enter “006” as “display group number” via the keypad in display zone -2- and confirm entry with the “Q” key (moves piston to original position).

– Press the green arrow button (bottom left) to exit from the input mask.



Note

Event memory interrogated, indicated faults eliminated and memory erased.

– With ignition switched off, disconnect vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052- from diagnostic connection in vehicle.

Caution

After installing the brake pads and before driving the vehicle, depress brake pedal firmly several times with the vehicle stationary, so that the brake pads are properly seated in their normal operating position.

– Check brake fluid level and top up if necessary.

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

2.5 Removing and installing brake disc

Detaching

– Raise vehicle.

– Remove wheels.

– Unclip brake hose and electrical wire from retainer on hub carrier.

Note

- *Do not unplug connection of actuator motor or brake system, otherwise a fault will be registered in the memory.*
- *Do not apply tension on brake hose or electrical wiring.*

– Detach brake caliper with pads and brake carrier ⇒ page 129 .

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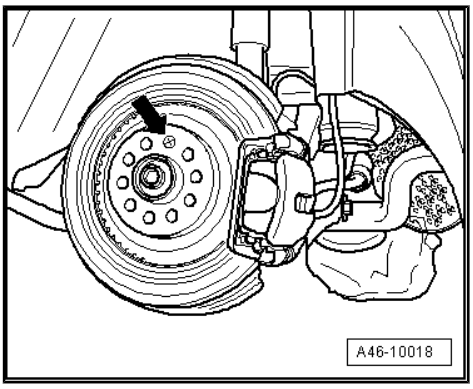
Do not leave brake caliper and brake carrier hanging from brake hose but secure them to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

WARNING

Do not apply brake when brake caliper is removed.

– Remove locating bolt -arrow- from brake disc, holding brake disc in position.

– Take brake disc off wheel hub.



Note

Take care to keep the brake disc straight when taking it off the wheel hub.

Installing

Clean brake disc, wheel hub and contact surfaces before installing.

– Fit brake disc onto wheel hub.

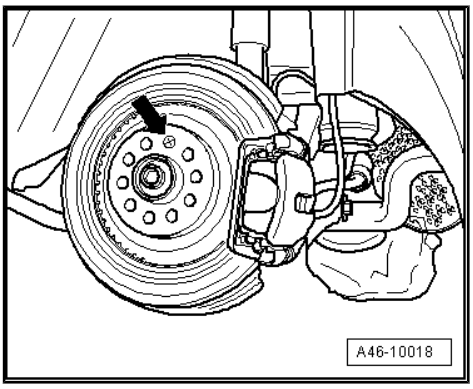
Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.

– Screw in locating bolt -arrow- and tighten.

– Install brake caliper with brake carrier ⇒ page 129 .

– Clip brake hose and electrical wire into retainer on hub carrier.



Note

Make sure that brake hose is properly clipped into retainer on hub carrier and securely seated. Otherwise, there is a risk that the brake hose will not remain in the retainer.

– Fit wheels.

– Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Lower vehicle.

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2.6 Renew brake disc

Removing

– Raise vehicle.

– Remove wheels.

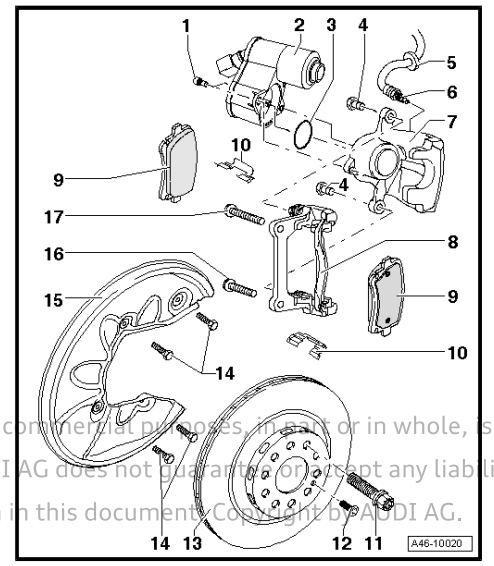
– Unclip brake hose and electrical wire from retainer on hub carrier.

Note

- *Do not unplug connection of actuator motor or brake system, otherwise a fault will be registered in the memory.*
- *Do not apply tension on brake hose or electrical wiring.*

– Remove rear brake pads ⇒ page 125 .

– Remove bolts -16 and 17- and detach brake carrier.



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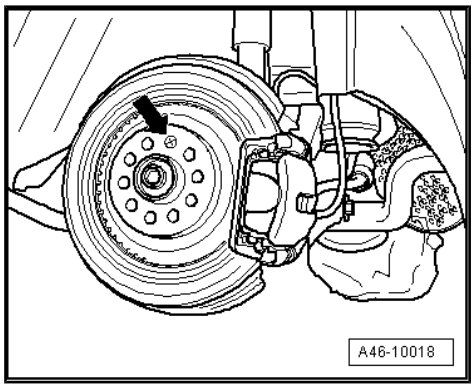
– Remove locating bolt -arrow-, holding brake disc in position.

– Take brake disc off wheel hub.



Note

Take care to keep the brake disc straight when taking it off the wheel hub.

Installing

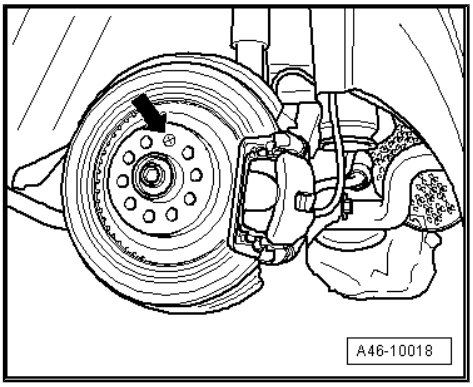
Clean brake disc, wheel hub and contact surfaces before installing.

– Fit brake disc onto wheel hub.

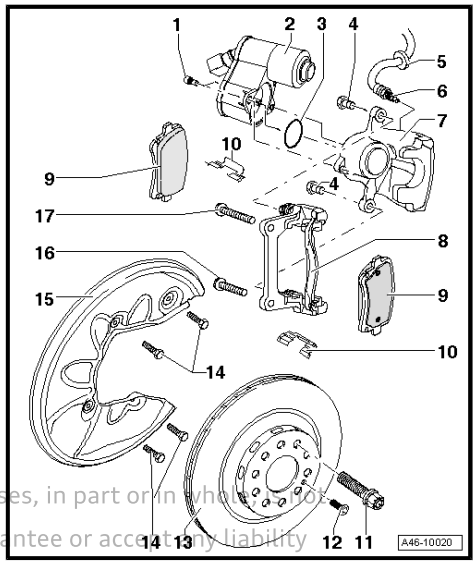
Note

Take care to keep the brake disc straight when fitting it onto the wheel hub.

– Screw in locating bolt -arrow- and tighten.



– Install rear brake carrier. Fit bolts -16 and 17- and tighten.



Note

Use extension (commercially available) to tighten bottom bolt -16-. Top bolt -17- can be tightened without extension. Wheel housing liner must be slightly pressed aside.

– Install rear brake pads ⇒ page 125 .

– Clip brake hose and electrical wire into retainer on hub carrier.

Note

Make sure that brake hose is properly clipped into retainer on hub carrier and securely seated. Otherwise, there is a risk that the brake hose will not remain in the retainer.

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– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Lower vehicle.

2.7 Removing and installing splash plate

Removing

– Raise vehicle.

– Remove wheels.

– Remove rear brake disc ⇒ page 136 .

– Remove bolts on splash plate.

– Detach splash plate.

Installing

– Fit splash plate.

– Screw in and tighten bolts on splash plate.

– Install rear brake disc ⇒ page 136 .

– Clip brake hose and electrical wire into retainer on hub carrier.

Note

Make sure that brake hose is properly clipped into retainer on hub carrier and securely seated. Otherwise, there is a risk that the brake hose will not remain in the retainer.

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Lower vehicle.

2.8 Removing and installing splash plate - front-wheel drive vehicles

Splash plate (closed version).

Removing

– Raise vehicle.

– Remove wheels.

– Remove rear brake disc ⇒ page 136 .

– Remove wheel bearing housing ⇒ Running gear; Rep. gr. 42 ; Rear suspension; Wheel bearing housing, wheel bearing unit, shock absorber - front-wheel drive vehicles .

– Remove bolts on splash plate.

– Detach splash plate.

Installing

– Fit splash plate.

– Screw in and tighten bolts on splash plate.

– Install wheel bearing housing ⇒ Running gear; Rep. gr. 42 ; Rear suspension; Wheel bearing housing, wheel bearing unit, shock absorber - front-wheel drive vehicles .

– Install rear brake disc ⇒ page 136 .

– Clip brake hose and electrical wire into retainer on hub carrier.

Note

Make sure that brake hose is properly clipped into retainer on hub carrier and securely seated. Otherwise, there is a risk that the brake hose will not remain in the retainer.

– Fit wheels.

Tightening torque for wheel bolts ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts

– Lower vehicle.

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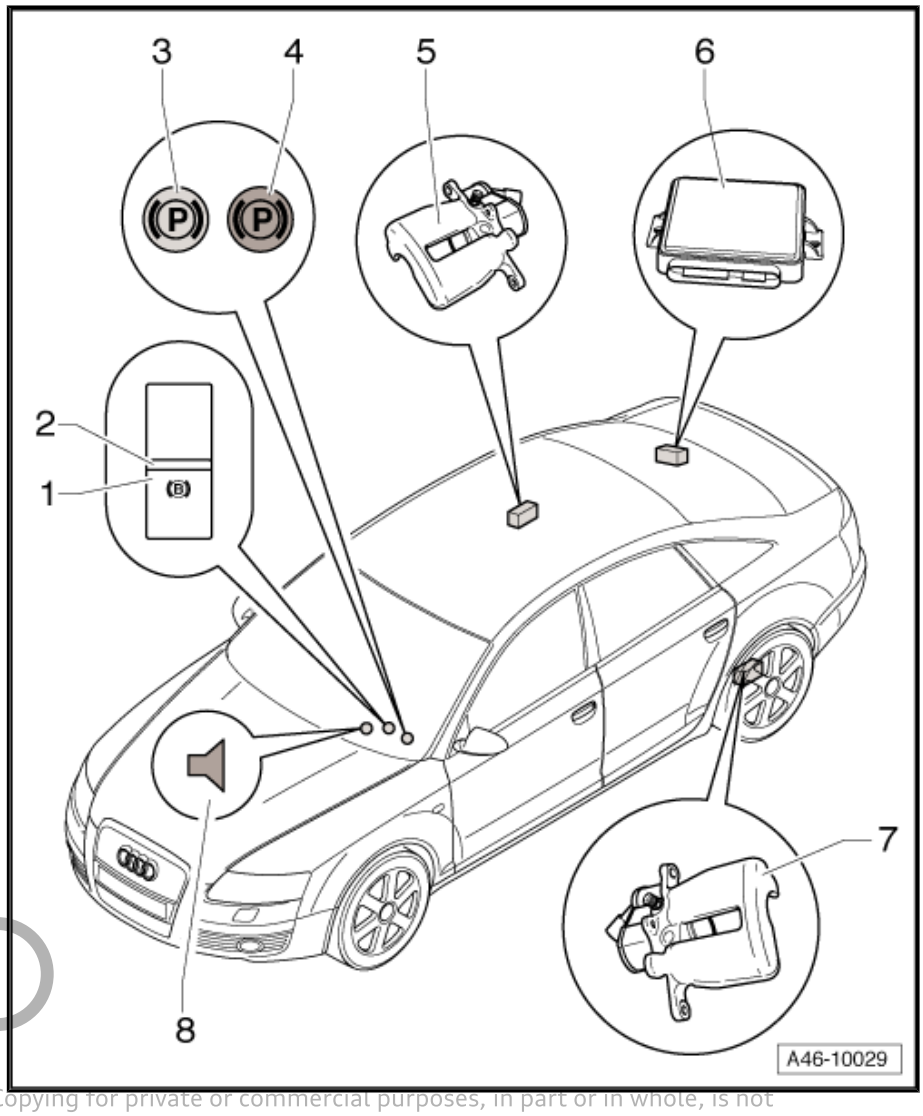
3 Parking brake

⇒ “3.1 Overview of fitting locations - parking brake”, page 141

⇒ “3.2 Removing and installing control unit for electromechanical parking brake J540 ”, page 142

⇒ “3.3 Removing and installing parking brake motor V282 / V283 ”, page 143

3.1 Overview of fitting locations - parking brake



1 - Parking brake contact switch - F321-

Switch is permanently lit for easy identification at night

- ❑ Pull switch ⇒ to apply brake
- ❑ Press switch ⇒ to release brake; vehicle must then be held with footbrake
- ❑ Fitting location: in centre console
- ❑ Removing and installing ⇒ page 44

2 - LED (light-emitting diode)

- ❑ Fitting location: in parking brake switch
- ❑ Lights up when parking brake is applied
- ❑ Indicator lamp in instrument cluster as additional display

Indicator bar lights up red when vehicle is retarded by EPB at speeds above 7 km/h. The system also sounds an audible warning tone.

3 - EPB system fault warning lamp (yellow)

- ❑ In case of malfunction of the parking brake the yellow symbol in the instrument cluster display lights up additionally and the warning: Parking brake! is displayed.

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4 - Indicator lamp for electromechanical parking brake

Lamp lights up red:

- ❑ To indicate that required clamping force has been built up
- ❑ The lamp lights up with parking brake applied and ignition switched on.
- ❑ The lamp stays on for approx. 20 seconds after the ignition is switched off.
- ❑ If the parking brake is applied with ignition switched off, the lamp lights up for approx. 20 seconds.
- ❑ The lamp should go out when the parking brake is released.

Lamp flashes red:
If the lamp flashes red continuously after the parking brake has been applied, this can have one of the following causes:

- The braking force developed by the parking brake is not sufficient to prevent the vehicle from rolling
- The temperature of the brakes is too high

If the lamp flashes red, the vehicle must be held by another means

Lamp lights up green:

- Lamp indicates that Audi hold assist (AHA) is active

Yellow warning lamp lights up additionally:

- In case of malfunction of the parking brake the yellow symbol in the instrument cluster display lights up additionally and the warning: Parking brake! is displayed.

5 - Actuator motor for electronic parking brake with brake caliper

- Removing and installing ⇒ page 143
- Detaching and attaching brake caliper ⇒ page 129

6 - Control unit for electromechanical parking brake - J540-

- Fitting location: in rear right side panel behind side trim
- Removing and installing ⇒ page 142
- 9 Nm

7 - Actuator motor for electronic parking brake with brake caliper

- Removing and installing ⇒ page 203
- Detaching and attaching brake caliper ⇒ page 129

8 - Acoustic signal

- Warning signal if parking brake is operated while road speed is above 7 km/h
- Warning signal if a fault is detected in system

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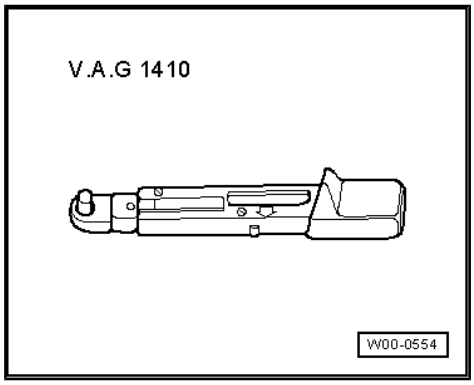
3.2 Removing and installing control unit for electromechanical parking brake - J540-

Special tools and workshop equipment required

- Torque wrench - V.A.G 1410-



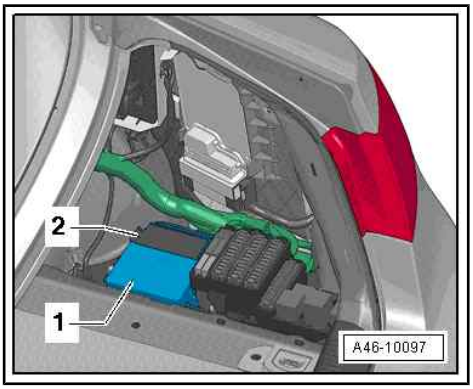
Removing

– Fold out side trim in luggage compartment (rear right) ⇒ General body repairs, interior; Rep. gr. 70 ; Luggage compartment trim panels; Removing and installing luggage compartment side trim .

A control unit for trailer operation is fitted on some models. The control unit for trailer operation and its mounting bracket must first be removed before removing the control unit for electromechanical parking brake.

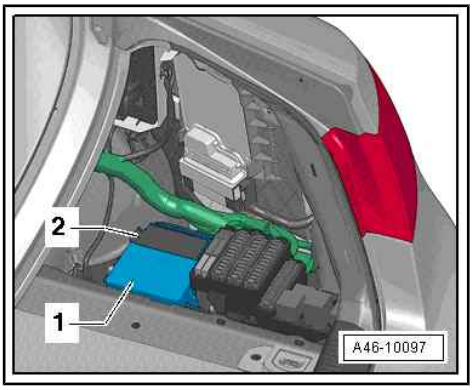
– Unscrew nuts.

– Slide retainer catch of electrical connection -2- forwards.
– Take out control unit for EPB -1- with electrical connection.
– Unplug electrical connection from control unit.
– Remove control unit from vehicle.



Installing

– Plug in electrical connection -2- to control unit.
– Slide retainer catch on connector to the rear so it engages.
– Install control unit.
– Fit nuts: 9 Nm.



Install control unit for trailer operation and bracket, if fitted. Bracket: 3 Nm.

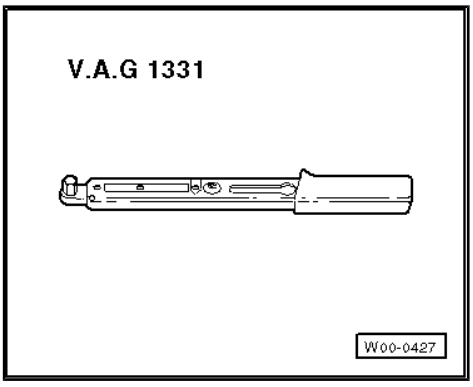
– If the control unit for electromechanical parking brake has been renewed, select the function “Replace” for the relevant control unit in the “Guided Fault Finding”.

Use vehicle diagnostic, testing and information system - VAS 5051B- or -5052-.

3.3 Removing and installing parking brake motor -V282- / -V283-

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1331-



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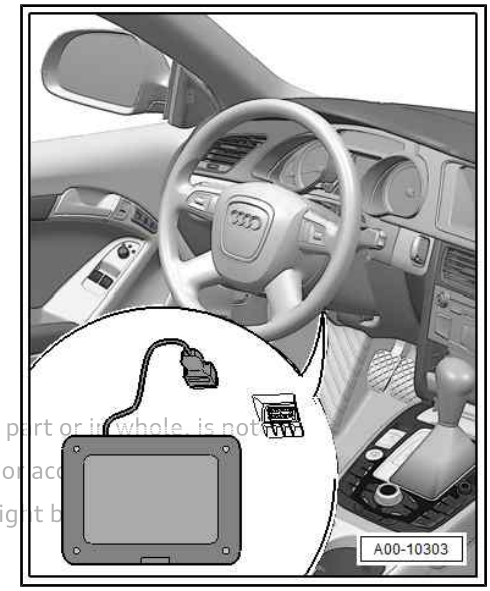
- Vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052-



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Removing

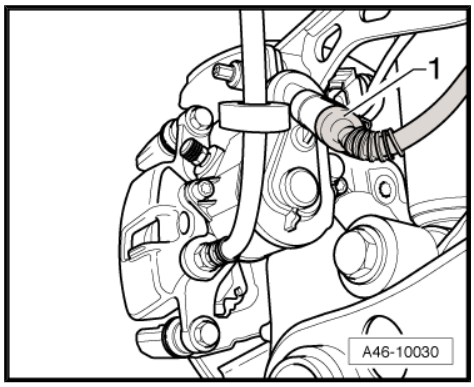
Note

- *Ignition on*
- *Release parking brake.*
- *Event memory interrogated, indicated faults eliminated and memory erased.*
- *Ignition off*

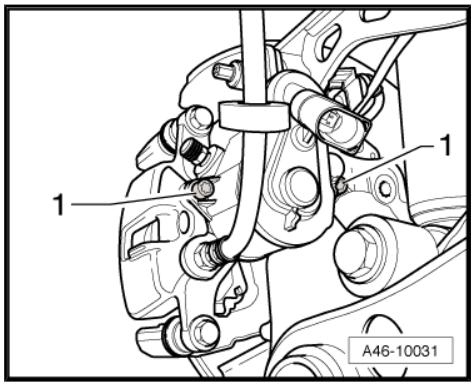
– Raise vehicle.
– Remove wheels.

Note

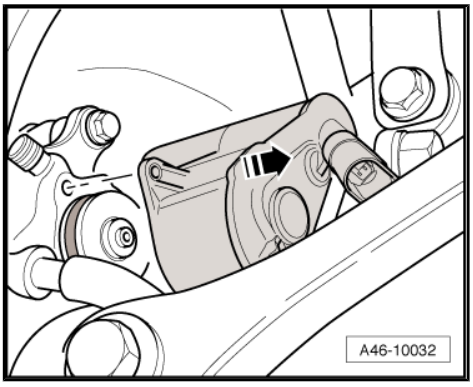
- *Ignition must be switched off at least 30 sec. before unplugging connector.*
- *Clean whole area around connector and actuator motor/brake caliper.*
- *Unplug connector -1- for actuator motor.*



– Unscrew both securing bolts -1- on actuator motor.

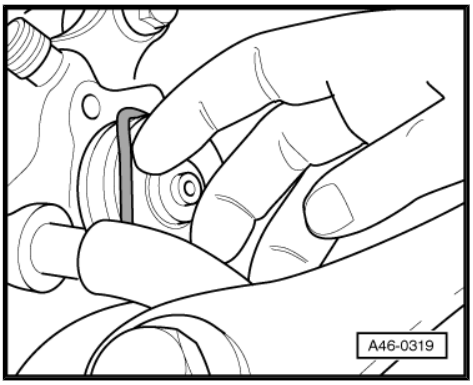


– Detach actuator motor in direction of arrow.



– Remove seal with suitable tool.

Make sure you do not damage annular groove for seal and contact surface on actuator motor.



Note

Do not use tools with sharp edges.

– If necessary clean annular groove and contact surfaces. Use only brake cleaner.

Installing

– Fit new seal.

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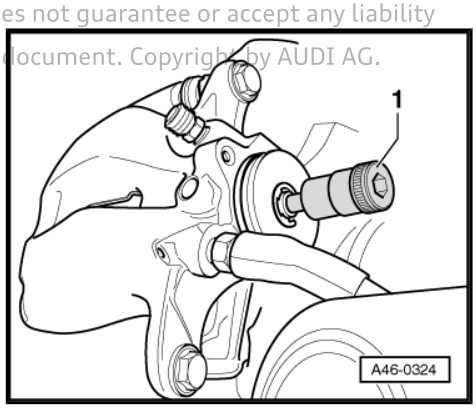
– Turn adjusting screw -1- on brake caliper back slightly.



Note

This makes it easier to install the actuator motor.

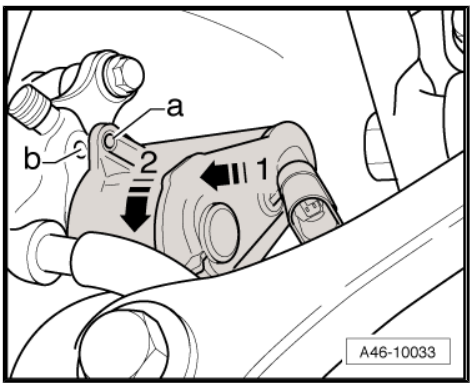
– Fit actuator motor.

Note

Ensure that seal is fitted correctly.

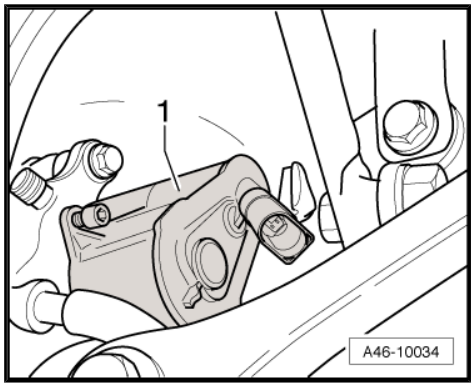
– Then turn actuator motor in such a way (item -2-) that bolt hole -a- and thread in brake caliper housing -b- are aligned.

Make sure that the actuator motor is flush with the brake caliper housing.



– Fit both securing bolts on actuator motor. Tightening torque: 12 Nm

Important: Bolts must be fitted and screwed in several turns by hand. If the thread is damaged the complete brake caliper has to be renewed.



Note

- *To avoid any damage to connector only fit it by hand.*
- *Make sure that the connections on vehicle wiring and actuator motor are clean and undamaged.*

– Fit connector.

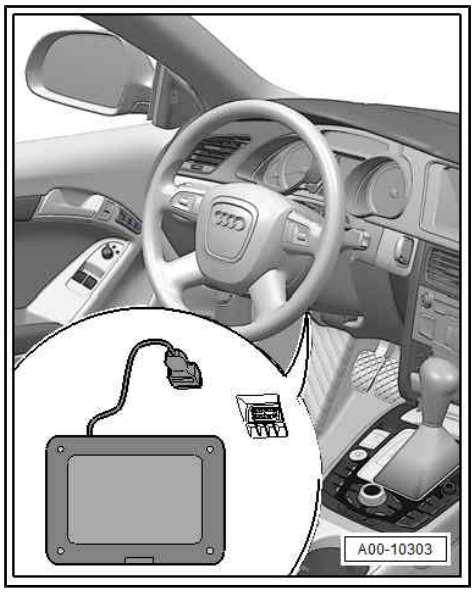
– Install wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts .

After renewing actuator motor you must use vehicle diagnostic tester to perform basic setting in EPB function.

To do so, use vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052- .

– Connect vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052- .

– Then select required functions under “Function”.



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4 Brake pedal

⇒ “4.1 Exploded view - brake pedal”, page 147

⇒ “4.2 Removing and installing mounting bracket”, page 149

⇒ “4.3 Separating brake pedal from brake servo”, page 169

⇒ “4.4 Connecting brake pedal to brake servo”, page 171

⇒ “4.5 Removing and installing brake pedal”, page 173

⇒ “4.6 Removing and installing mounting for brake servo push rod”, page 180

4.1 Exploded view - brake pedal

WARNING

The brake pedal travel must not be restricted by additional floor coverings.

- Lubricate all bearings and contact surfaces with grease - G 000 450 02- .

1 - Mounting bracket for pedal cluster

- Illustration for vehicle with automatic gearbox
- Removing and installing; vehicles with manual gearbox
  ⇒ page 149
- Removing and installing; vehicles with automatic gearbox
  ⇒ page 160

2 - Sleeve

3 - Shaft for brake pedal

4 - Pivot pin

5 - Securing clip (spring steel), right-side

⇒ ETKA

6 - Washer

7 - Bolt for accelerator pedal module

- 8 Nm

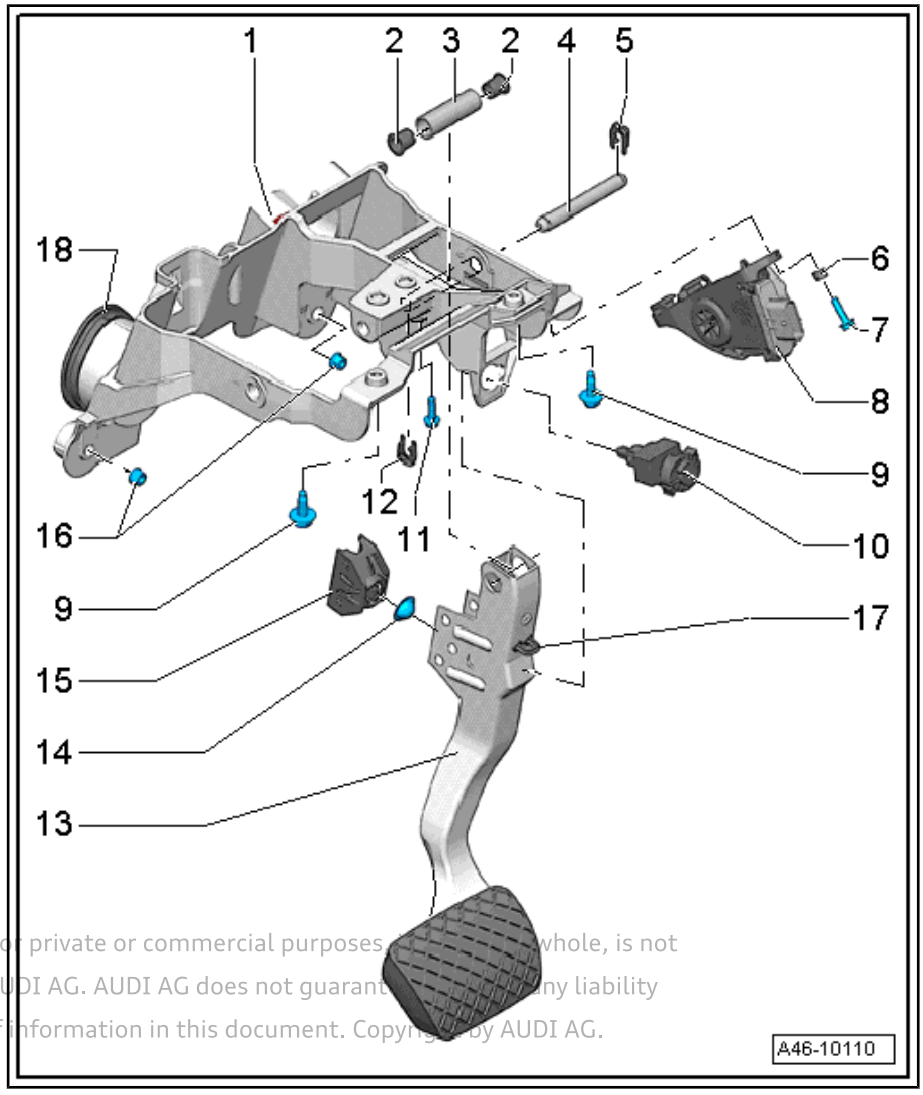
8 - Accelerator pedal module

9 - Bolt for pedal bracket

- 20 Nm

10 - Brake light sensor

- Removing and installing



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⇒ page 40

11 - Bolt for pivot pin

- ❑ Bolt holds pivot pin in position
- ❑ 8 Nm

12 - Securing clip (spring steel), left-side

⇒ ETKA

13 - Brake pedal

- ❑ Removing and installing; vehicles with manual gearbox ⇒ page 173
- ❑ Removing and installing; vehicles with automatic gearbox ⇒ page 175

WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

14 - Bearing shell (is pressed into mounting)

- ❑ For ball head of brake servo push rod

15 - Mounting bracket

- ❑ For ball head of brake servo push rod
- ❑ With retaining lugs for ball head
- ❑ Removing and installing ⇒ page 180

16 - Nut

- ❑ 8 Nm

17 - Stop

WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

18 - Grommet

- ❑ Only fitted on vehicles with automatic gearbox

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4.2 Removing and installing mounting bracket

⇒ “4.2.1 Removing and installing mounting bracket - vehicles with manual gearbox”, page 149

⇒ “4.2.2 Removing and installing mounting bracket - vehicles with automatic gearbox”, page 160

4.2.1 Removing and installing mounting bracket - vehicles with manual gearbox

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Reversible ratchet - V.A.S 5122-
- Release tool - T40168- for brake light sensor.
- Release tool - T10006-

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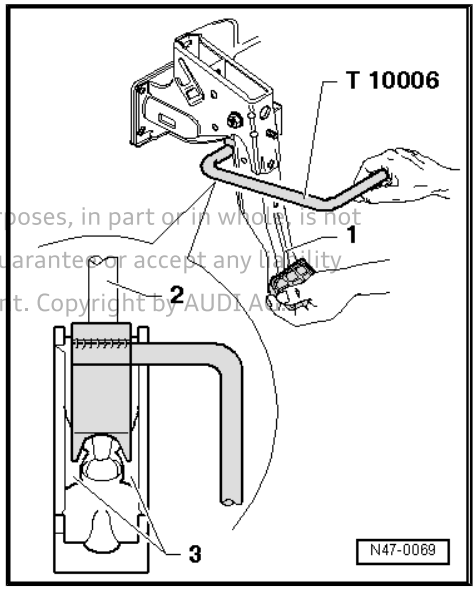
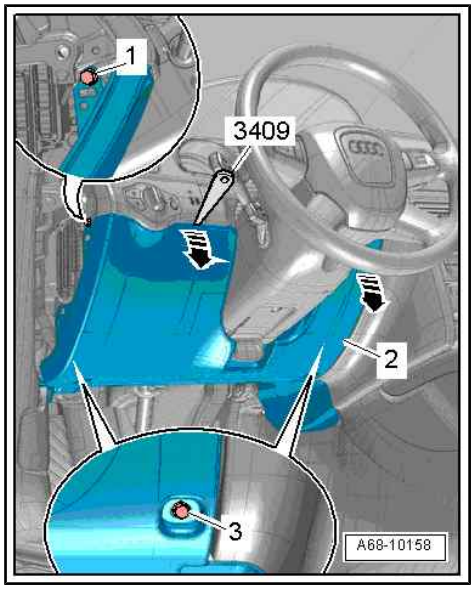


Removing

> **WARNING**
>
> *Line the footwell with a sufficient number of cloths to protect against brake fluid escaping at the clutch pedal.*

– Remove dash panel cover (driver side) -1 ... 3-.



– Unplug electrical connector -C- on footwell vent.
– Remove footwell vent -A-B-.
– Remove brake light sensor ⇒ page 40 .
– Unplug electrical connector from accelerator pedal module.
– Separate brake pedal from brake servo ⇒ page 169 .

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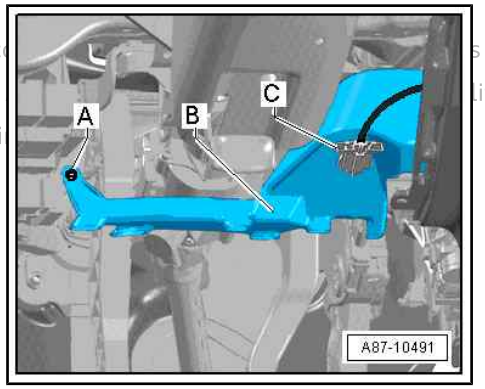


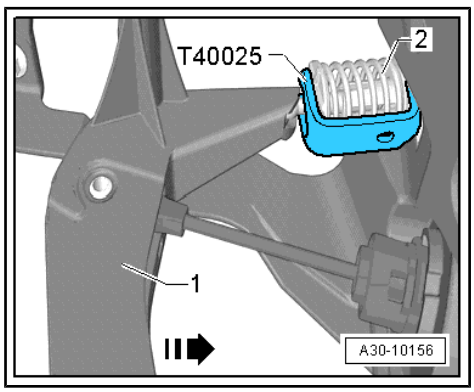
WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

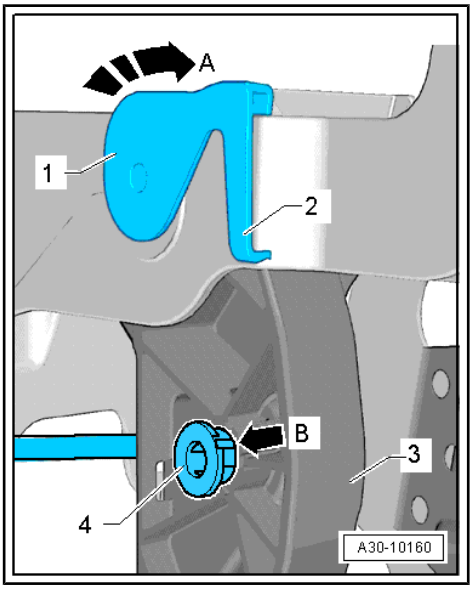
– Remove over-centre spring -2- on clutch pedal -1- ⇒ Rep. gr. 30 ; Clutch mechanism; Removing and installing over-centre spring .

Note

Note correct installation position of over-centre spring for subsequent re-installation.



– Pull pin -4- in clutch pedal for linkage to clutch master cylinder out of pedal arm -3-.

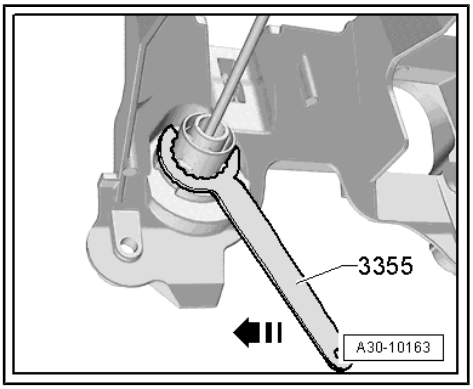


Note

Do not release catches -1 and 2- before removal.

– Release clutch master cylinder using release tool - 3355- .

Turn special tool clockwise -arrow-.



– Remove body brace.
– Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .
– Remove cover -2- above brake fluid reservoir.

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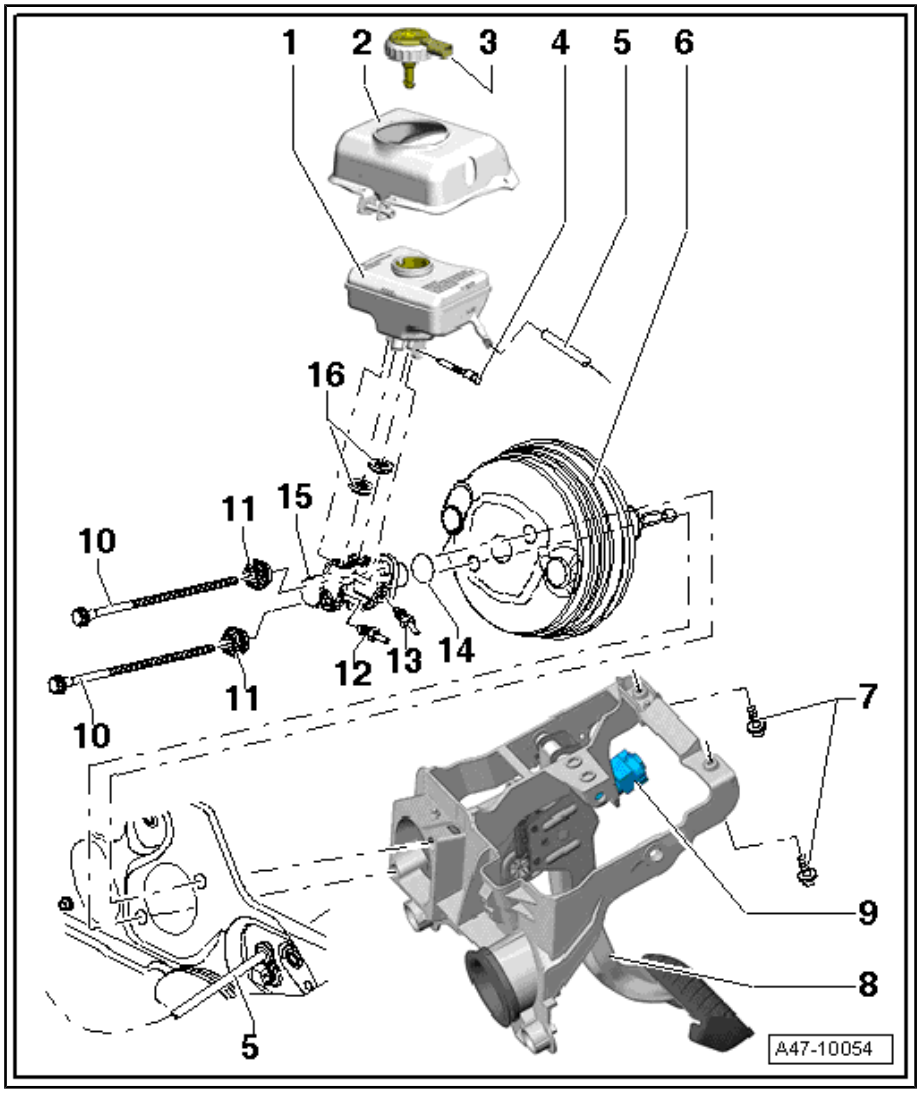
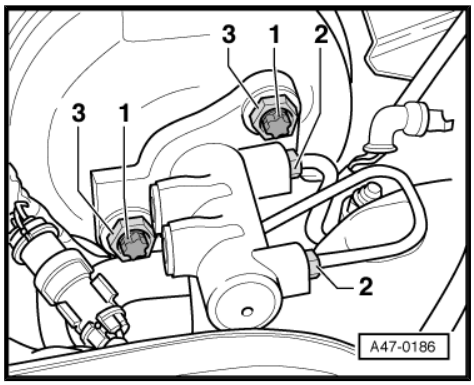


The cover -2- is not fitted on all vehicles.

– Remove bolts -1- securing brake servo to mounting bracket.
– Remove nuts -16- on mounting bracket guides.



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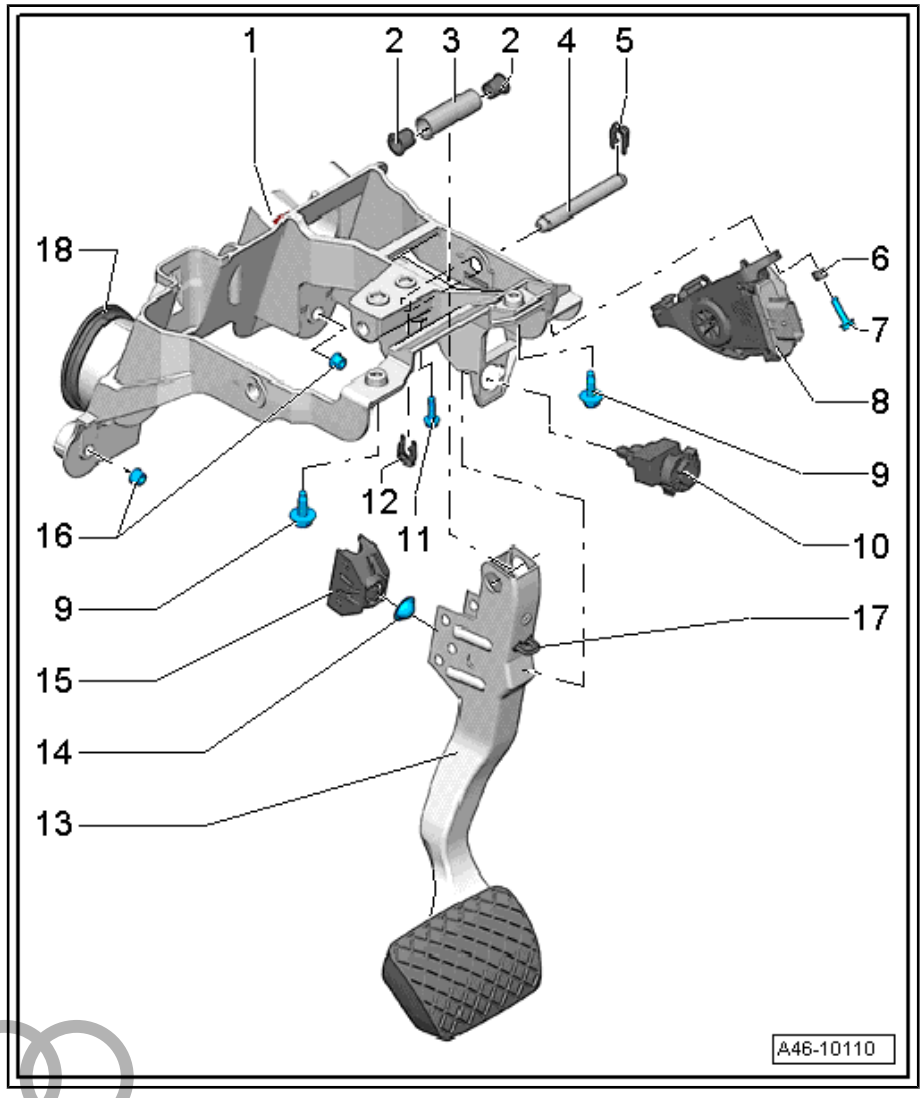

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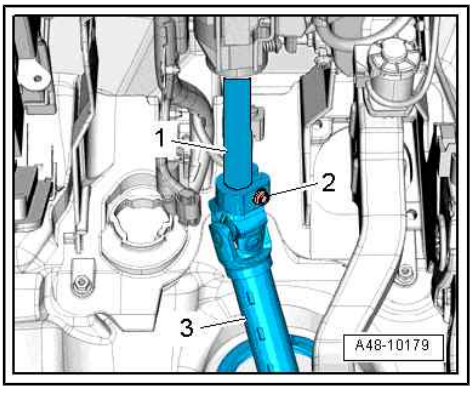
– Use full range of steering column adjustment to move steering wheel out as far as possible towards driver's seat.
– Turn steering wheel to straight ahead position. Wheels are in straight-ahead position.

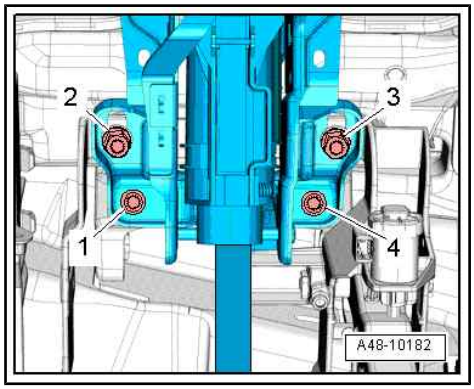
Note

Dash panel insert and steering wheel do not have to be removed in order to remove steering column.

– Remove bolt -2- for steering column at bottom.



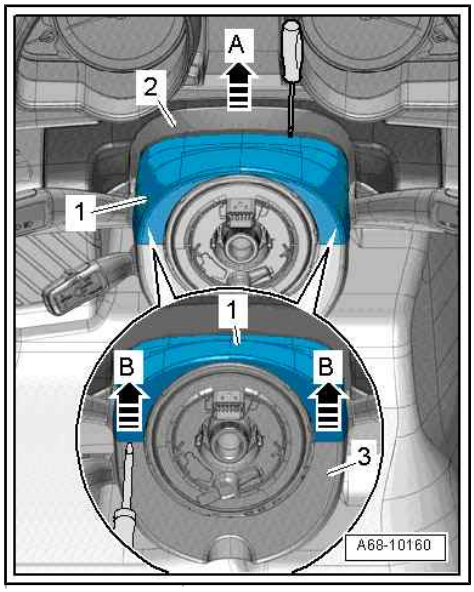
– Remove bottom bolts -2 to 4- for steering column and mounting bracket.



– Unclip trim cover -2- from trim -1- (top) for steering column switch module -arrow A-.
– Detach wiring guides from steering column.

Note

Shown in illustration without steering wheel. Steering wheel and dash panel insert do not have to be removed.



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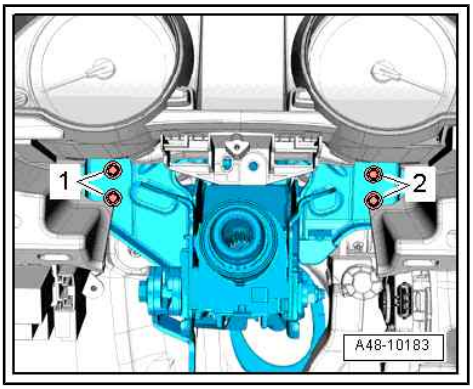
– Unscrew bolts -1 and 2- for steering column from central tube, supporting steering column by hand from below.



Note

Use ratchet with 3/8" drive (commercially available) and multi-point bit with extension to slacken and remove bolts -1 and 2-.

– Pull out steering column from steering shaft
– Carefully put down steering column with steering wheel.
– Remove mounting bracket from vehicle.

Caution

Make sure that the clutch master cylinder is not disconnected from the hydraulic line when taking out the mounting bracket.

The clutch master cylinder remains in the vehicle.

Installing

Renew all bolts.

WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

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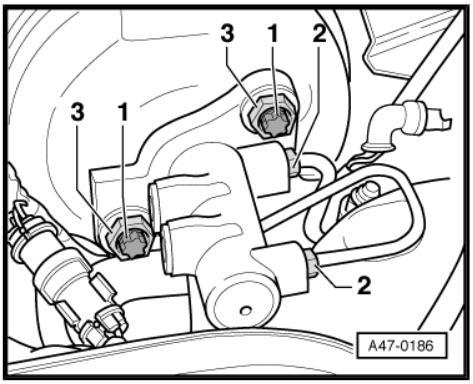
Check that the seal on the clutch master cylinder is correctly seated before fitting the mounting bracket.

– Insert mounting bracket in guides on vehicle.

Guide clutch master cylinder through aperture in mounting bracket and turn mounting bracket slightly to right so that cylinder mounts can be guided through mounting bracket.

– Fit nuts at mounting bracket guides to hold mounting bracket in position.

– Install and tighten bolts -1- securing brake servo to mounting bracket.



Note

First tighten bolts securing brake servo to mounting bracket.

– Tighten nuts -16- at mounting bracket guides.

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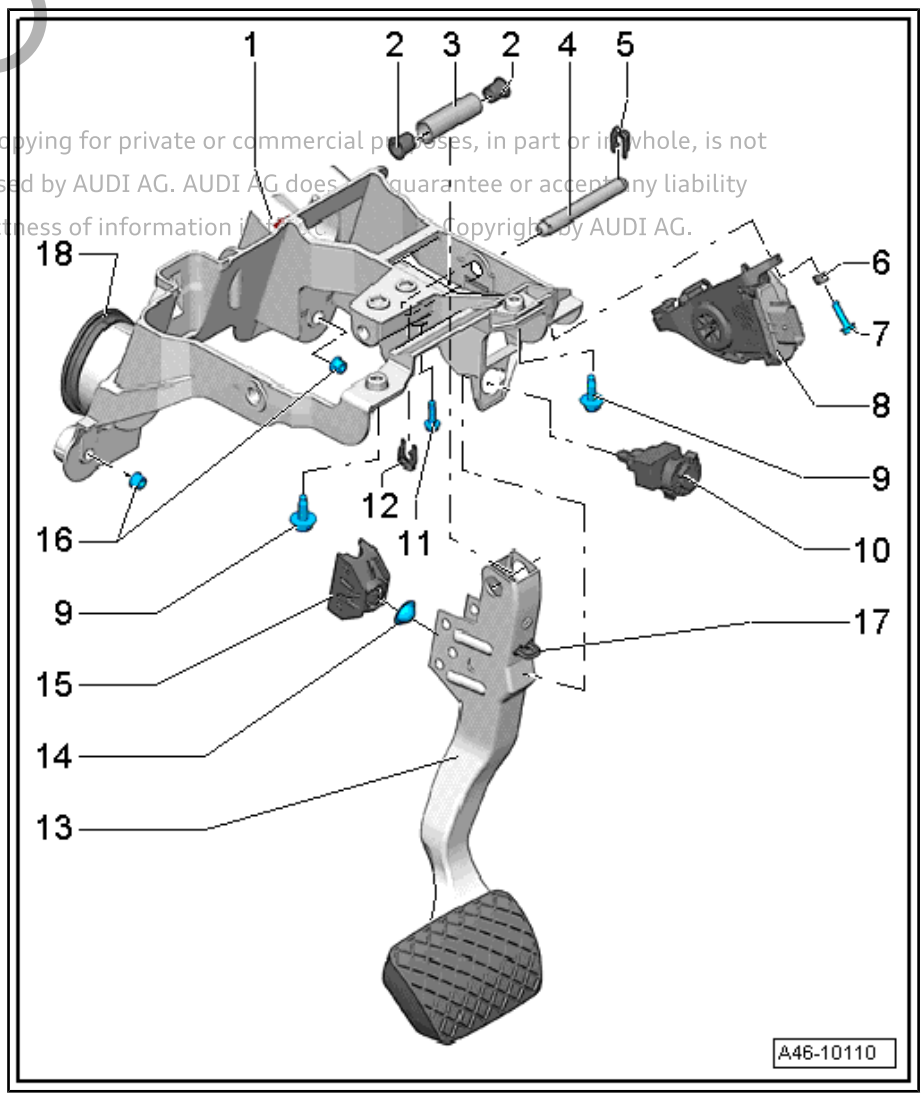
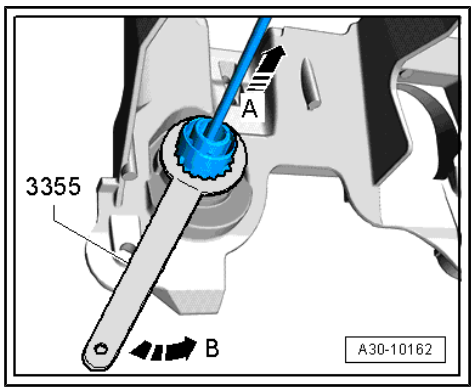


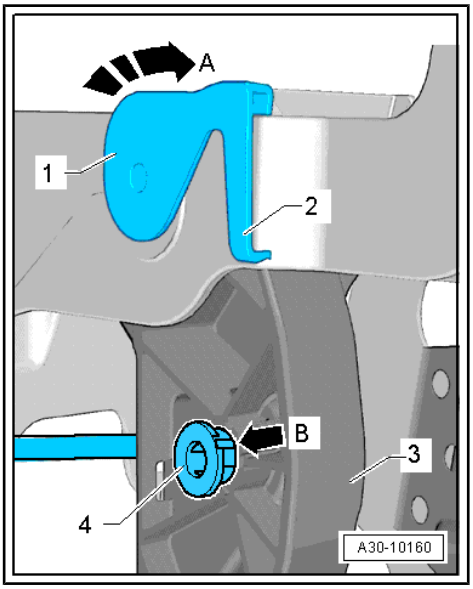
– Secure clutch master cylinder in mounting bracket using release tool - 3355- .

Turn special tool anti-clockwise -arrow B-, while at the same time pulling master cylinder forwards -arrow-.



– Push pin -4- for linkage to clutch master cylinder flush into clutch pedal.

Note correct installation position of pin. The shoulder -B- on the pin must be aligned with the slot in the pedal arm.

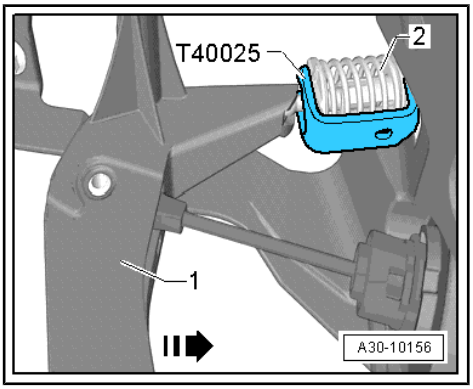


– Install over-centre spring -2- on clutch pedal ⇒ Rep. gr. 30 ; Clutch mechanism; Removing and installing over-centre spring .

– Plug in electrical connector for accelerator pedal module.

Attaching brake pedal to brake servo

– Hold ball head of push rod in front of mounting and push brake pedal towards brake servo so that ball head audibly locks into place.



WARNING

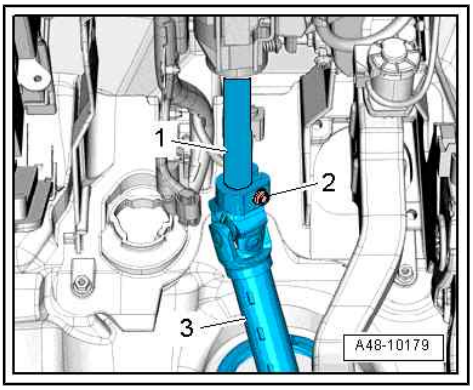
If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

– Install brake light sensor ⇒ page 40 .

– Slide steering column -1- onto steering shaft -3-.

Use new bolts.

– Fit steering column to central tube and insert bolts ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing steering column .



Note

Note different lengths of bolts ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Exploded view - steering column .

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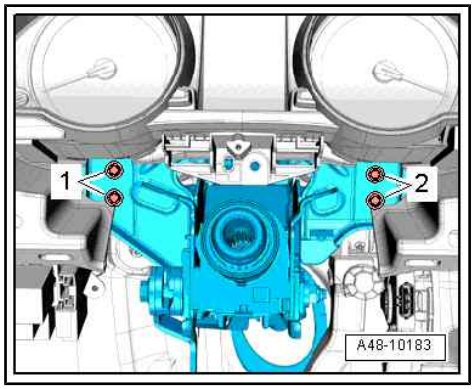
– Tighten bolts -1 and 2- to 20 Nm in diagonal sequence.



Note

Use ratchet with 3/8" drive (commercially available) and multi-point bit with extension to fit bolts -1 and 2-.

– Using torque wrench - V.A.G 1331- and reversible ratchet - V.A.S 5122- with extension, tighten bolts -1 and 2- to 20 Nm in diagonal sequence.
– Clip trim cover into trim (top) for steering column switch module.
– Attach wiring guides to steering column.
– Tighten bolt -2- on steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Exploded view - steering column .

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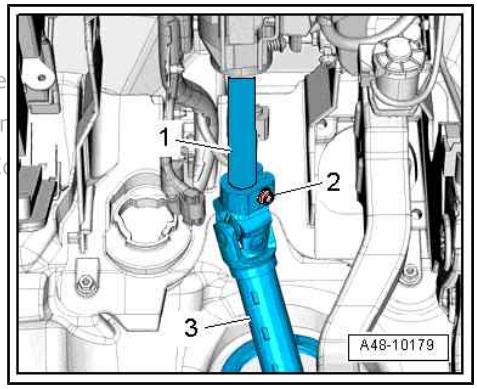
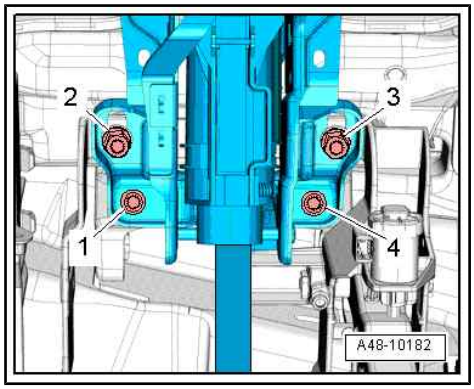
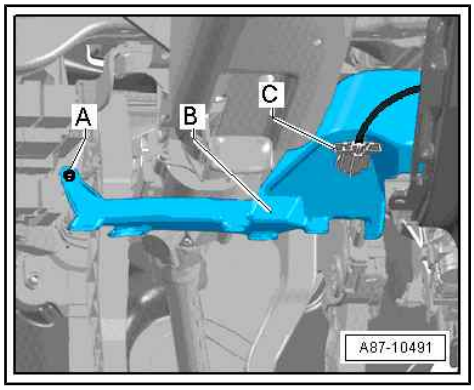
Use new bolts.



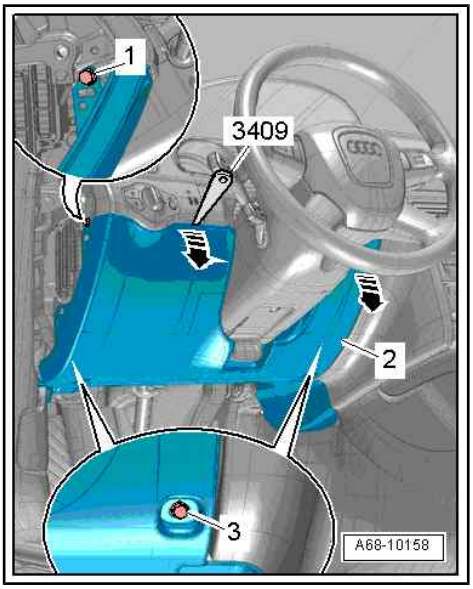
– Fit bottom bolts -1 to 4- for steering column and mounting bracket and tighten in diagonal sequence to 20 Nm ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Exploded view - steering column .

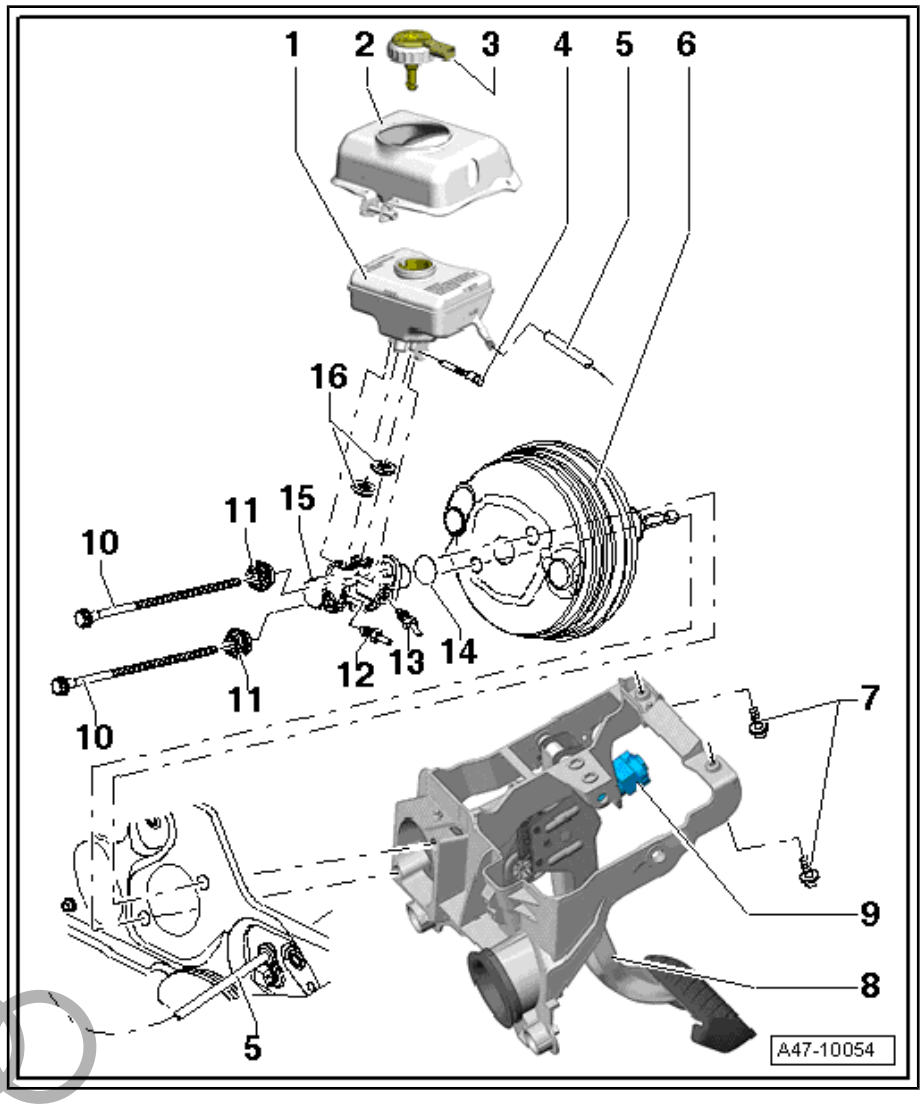


– Install footwell vent -A-B-.
– Plug in electrical connector -C- on footwell vent.



– Install dash panel cover (driver side) -1 ... 3-.
– Install cover -2- above brake fluid reservoir.





The cover -2- is not fitted on all vehicles.

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– Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .
– Install body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .

4.2.2 Removing and installing mounting bracket - vehicles with automatic gearbox

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Reversible ratchet - V.A.S 5122-
- Release tool - T40168- for brake light sensor.
- Release tool - T10006-

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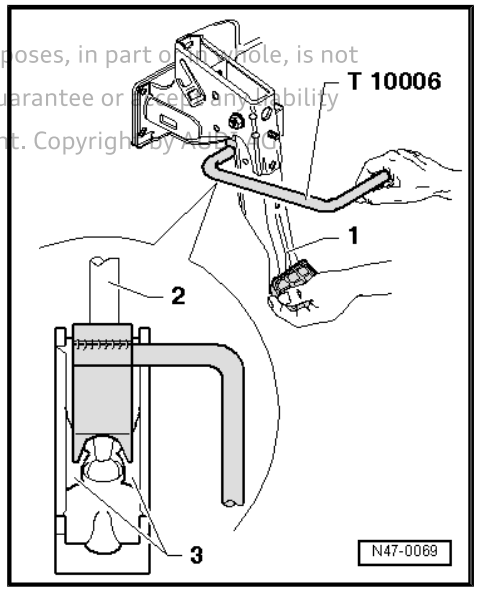
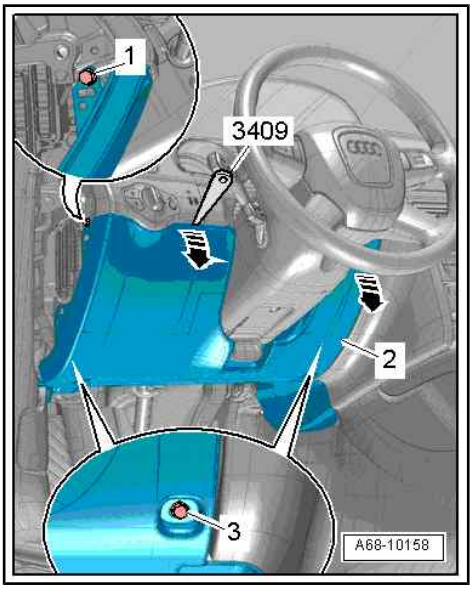


Removing

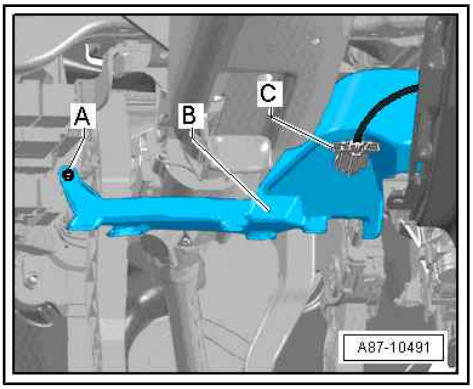
WARNING

Line the footwell with a sufficient number of cloths to protect against brake fluid escaping at the clutch pedal.

– Remove dash panel cover (driver side) -1 ... 3-.



– Unplug electrical connector -C- on footwell vent.
– Remove footwell vent -A-B-.
– Remove brake light sensor ⇒ page 40 .
– Unplug electrical connector from accelerator pedal module.
– Separate brake pedal from brake servo ⇒ page 169 .



WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

– Remove body brace.
– Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .
– Remove cover -2- above brake fluid reservoir.

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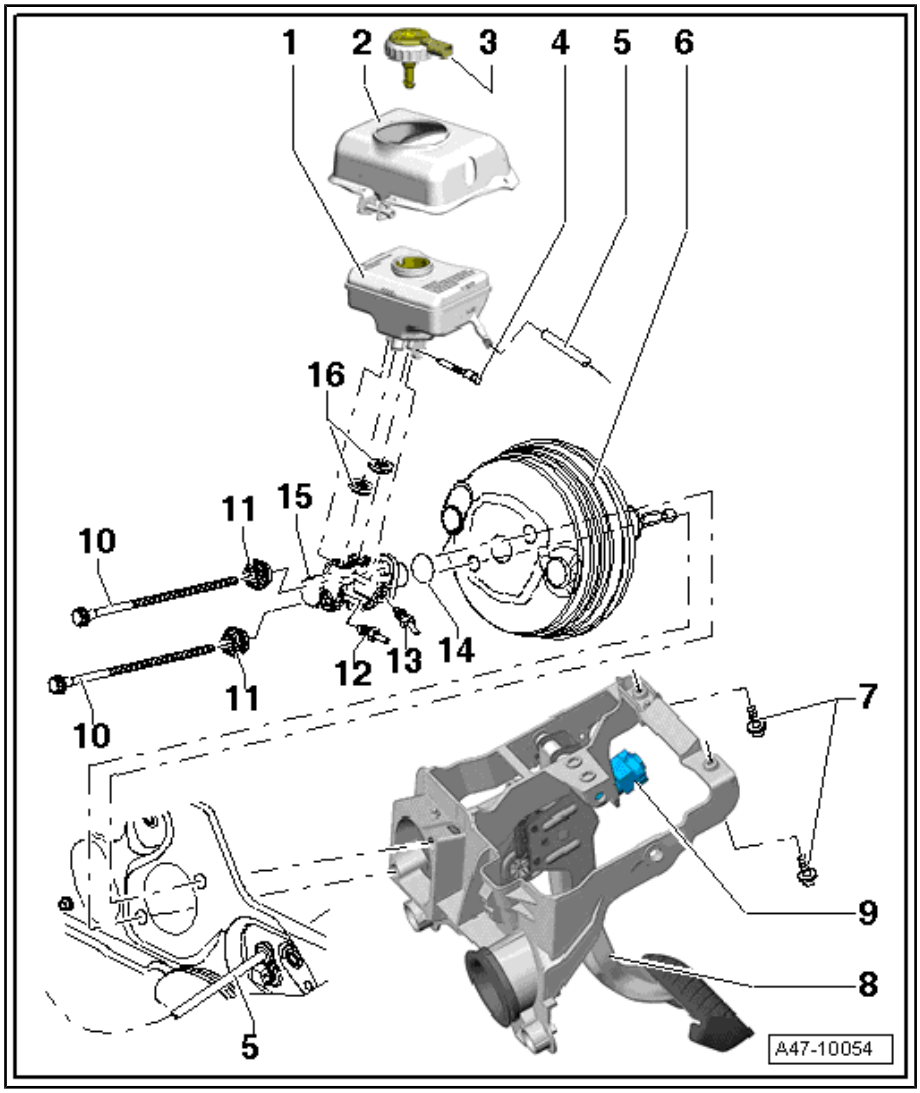
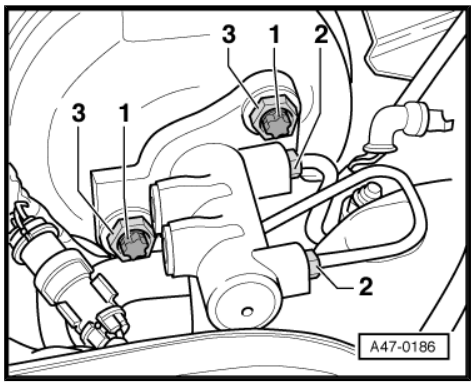


The cover -2- is not fitted on all vehicles.

– Remove bolts -1- securing brake servo to mounting bracket.
– Remove nuts -16- on mounting bracket guides.



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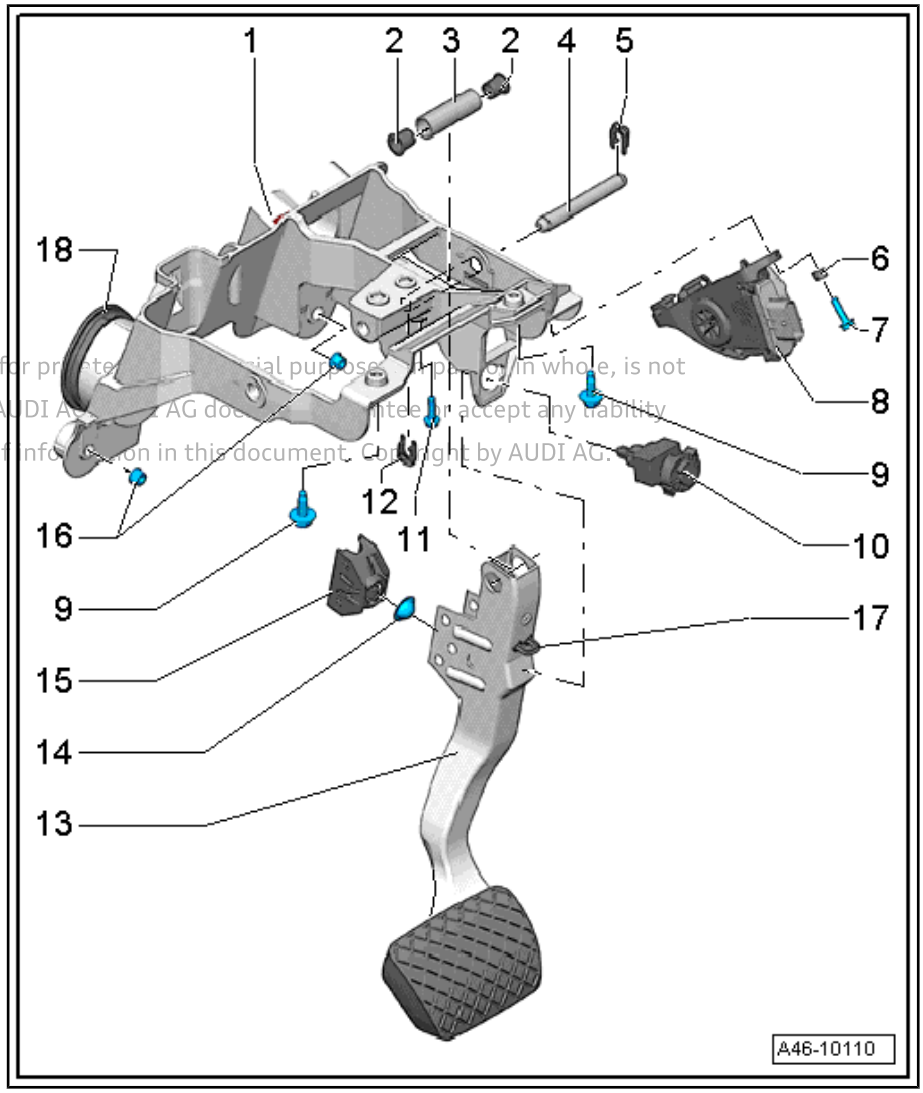

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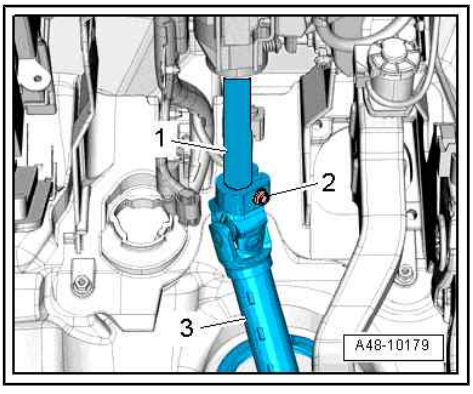
– Use full range of steering column adjustment to move steering wheel out as far as possible towards driver's seat.
– Turn steering wheel to straight ahead position. Wheels are in straight-ahead position.

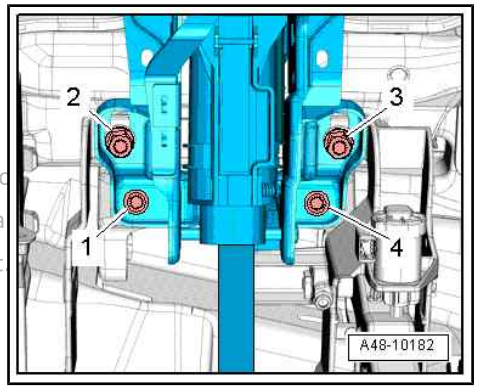
Note

Dash panel insert and steering wheel do not have to be removed in order to remove steering column.

– Remove bolt -2- for steering column at bottom.



– Remove bottom bolts -2 to 4- for steering column and mounting bracket.



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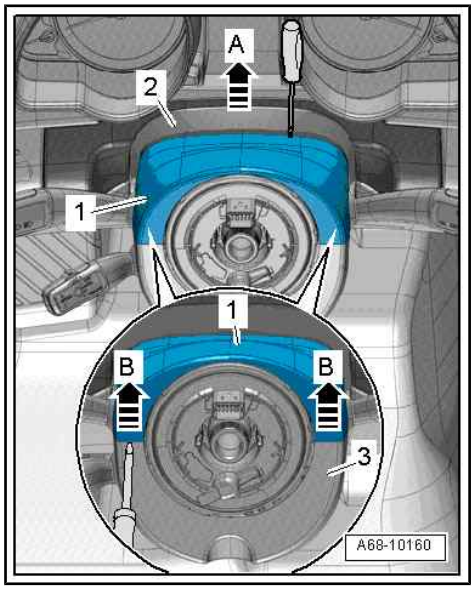
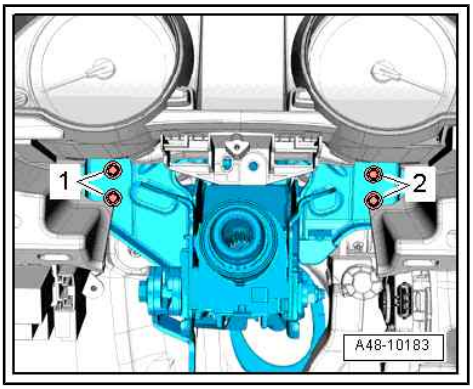
– Unclip trim cover -2- from top of trim -1- for steering column switch module (SMLS) -arrow A-.
– Detach wiring guides from steering column.



Note

Shown in illustration without steering wheel. Steering wheel and dash panel insert do not have to be removed.

– Unscrew bolts -1 and 2- for steering column from central tube, supporting steering column by hand from below.



Note

Use ratchet with 3/8" drive (commercially available) and multi-point bit with extension to slacken and remove bolts -1 and 2-.

– Pull out steering column from steering shaft
– Carefully put down steering column with steering wheel.
– Remove mounting bracket from vehicle.

Installing

Renew all bolts.

WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

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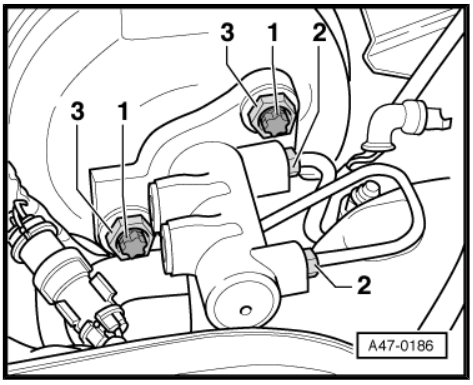
Check that seal to bulkhead is correctly seated before fitting mounting bracket.

– Insert mounting bracket in guides on vehicle.
– Fit nuts at mounting bracket guides to hold mounting bracket in position.

– Install and tighten bolts -1- securing brake servo to mounting bracket.



Note

First tighten bolts securing brake servo to mounting bracket.

– Tighten nuts -16- at mounting bracket guides.

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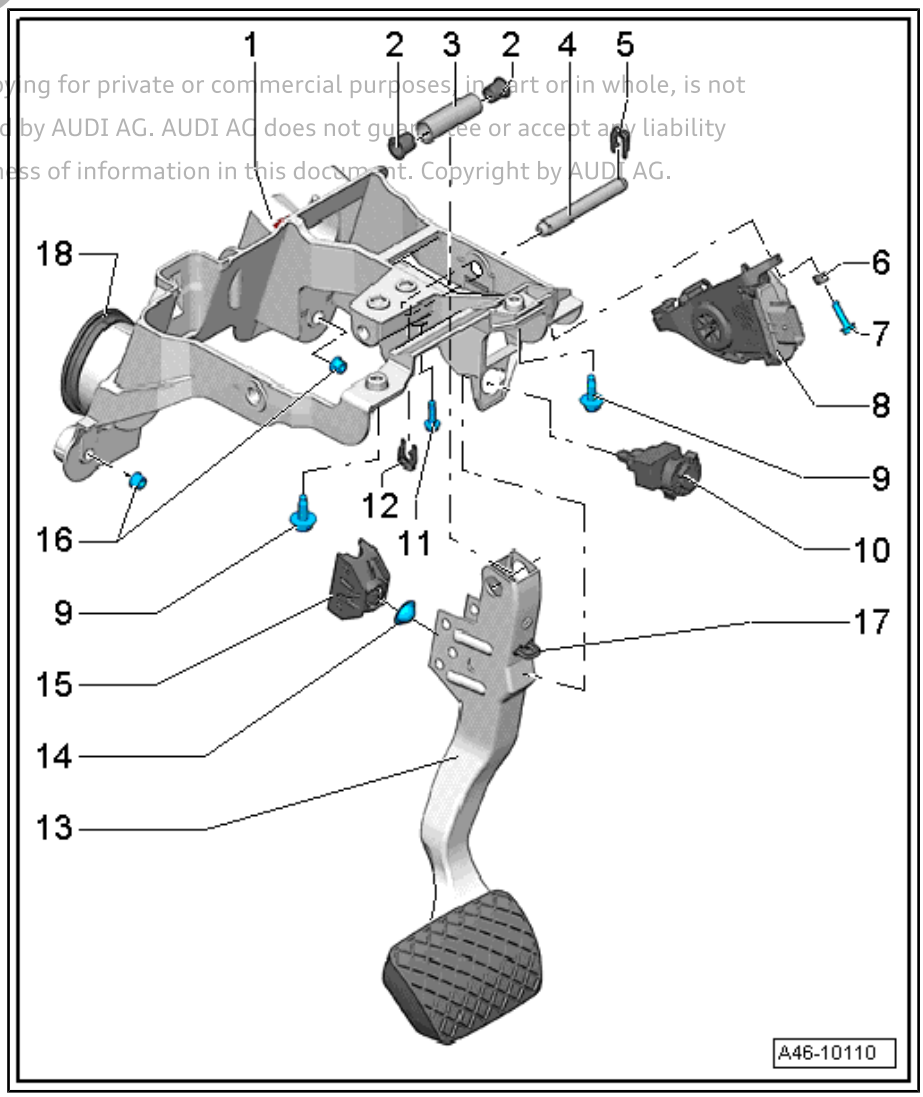


– Plug in electrical connector for accelerator pedal module.

Attaching brake pedal to brake servo

– Hold ball head of push rod in front of mounting and push brake pedal towards brake servo so that ball head audibly locks into place.

WARNING

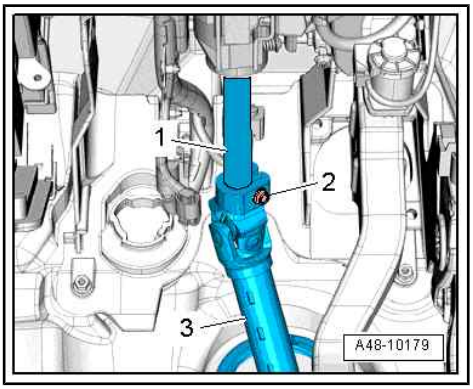
If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

– Install brake light sensor ⇒ page 40 .

– Slide steering column -1- onto steering shaft -3-.

Use new bolts.

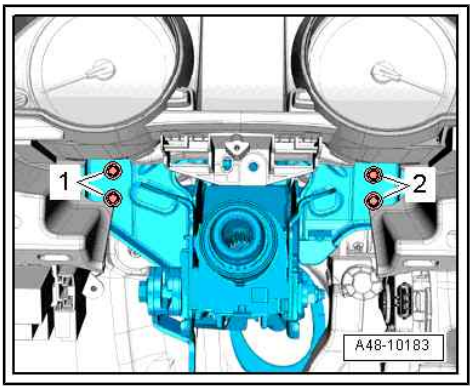
– Fit steering column to central tube and insert new bolts ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing steering column .



Note

Note different lengths of bolts ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Exploded view - steering column .

– Tighten bolts -1 and 2- in diagonal sequence to 20 Nm ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Exploded view - steering column .



Note

Use ratchet with 3/8" drive (commercially available) and multi-point bit with extension to fit bolts.

– Using torque wrench - V.A.G 1331- and reversible ratchet - V.A.S 5122- with extension, tighten bolts -1 and 2- to 20 Nm in diagonal sequence.

– Clip trim cover into trim (top) for steering column switch module.

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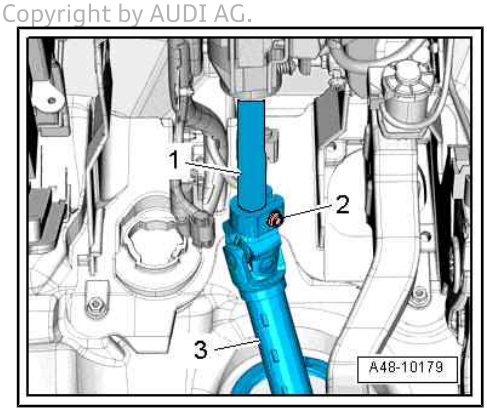
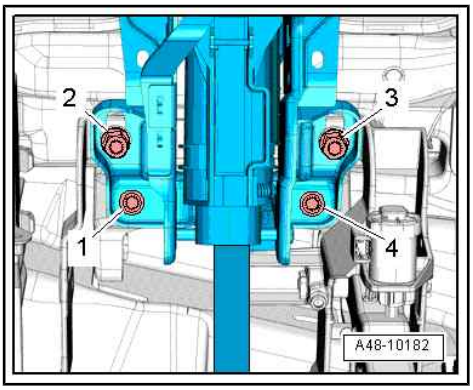
– Attach wiring guides to steering column.

– Tighten bolt -2- on steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Exploded view - steering column .

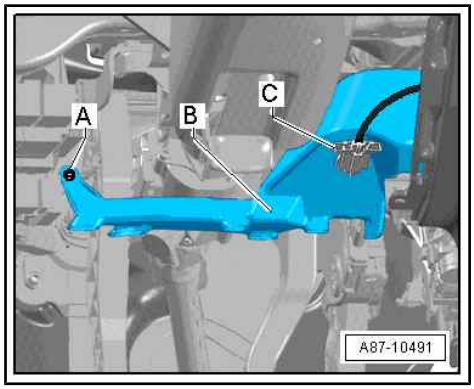
Use new bolts.



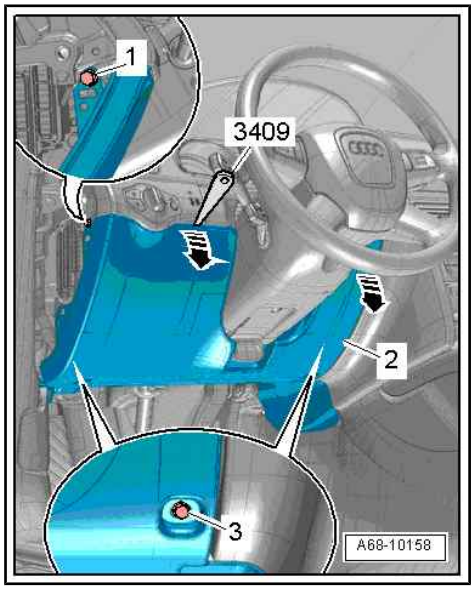
– Fit bottom bolts -1 to 4- for steering column and mounting bracket and tighten in diagonal sequence to 20 Nm ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Exploded view - steering column .



– Install footwell vent -A-.
– Plug in electrical connector -C- on footwell vent.



– Install dash panel cover (driver side) -1 ... 3-.
– Install cover -2- above brake fluid reservoir.



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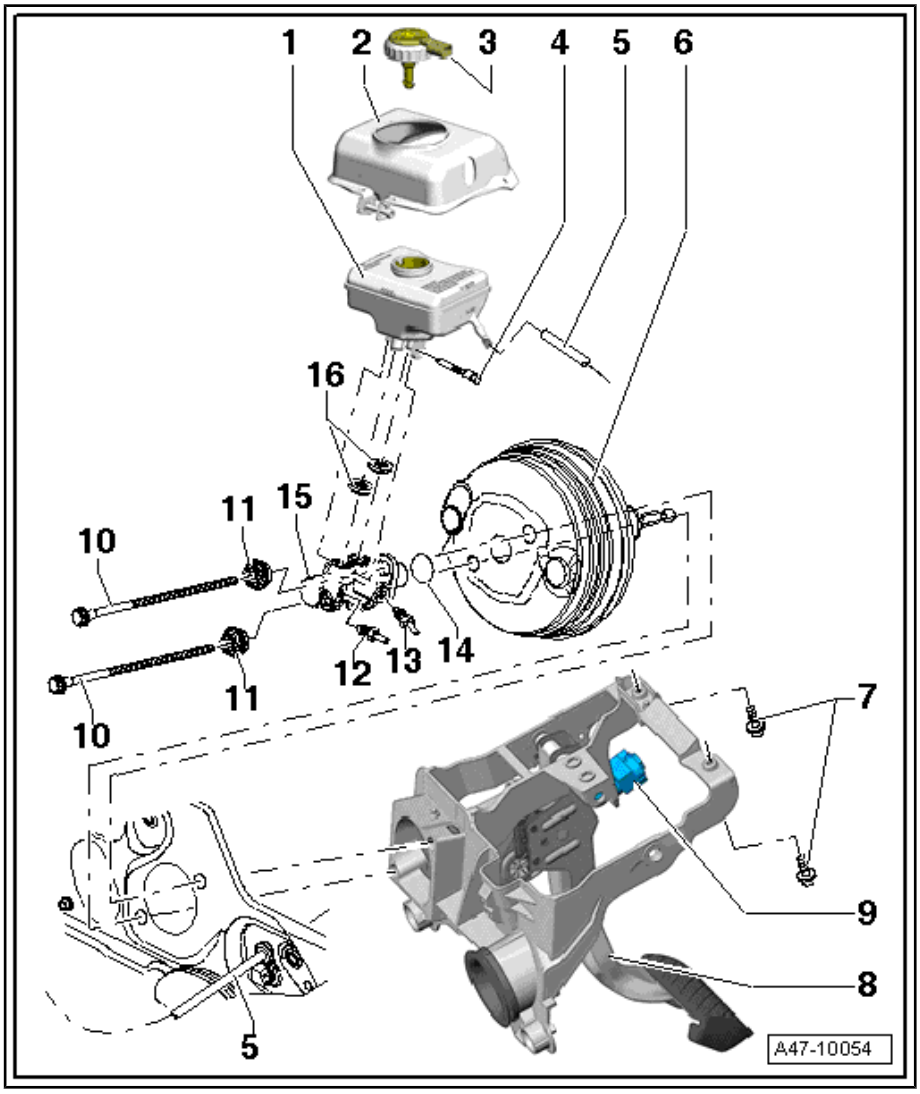

The cover -2- is not fitted on all vehicles.

– Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .

– Install body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .

4.3 Separating brake pedal from brake servo

Separating brake pedal from brake servo

WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

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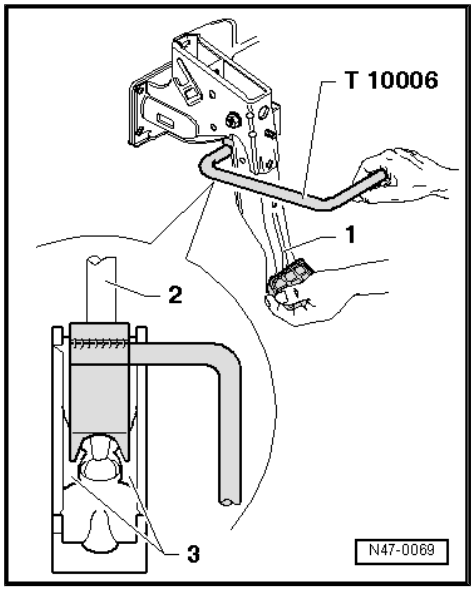
Special tools and workshop equipment required

♦ Release tool - T40168- for brake light sensor.

♦ Release tool - T10006-



– Remove driver's storage compartment -1 ... 3-.

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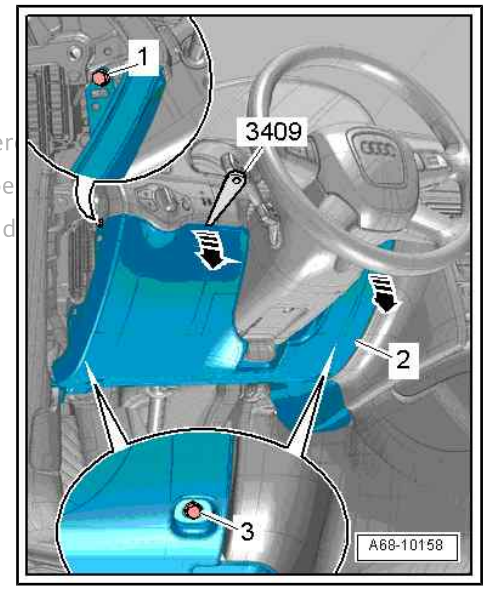
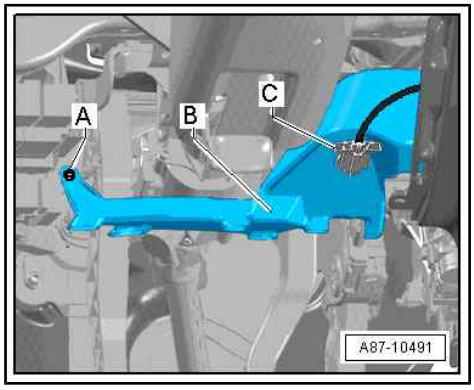


– Unplug electrical connector -C- on footwell vent.
– Remove footwell vent -A-B-.
– Remove brake light sensor ⇒ page 40 .



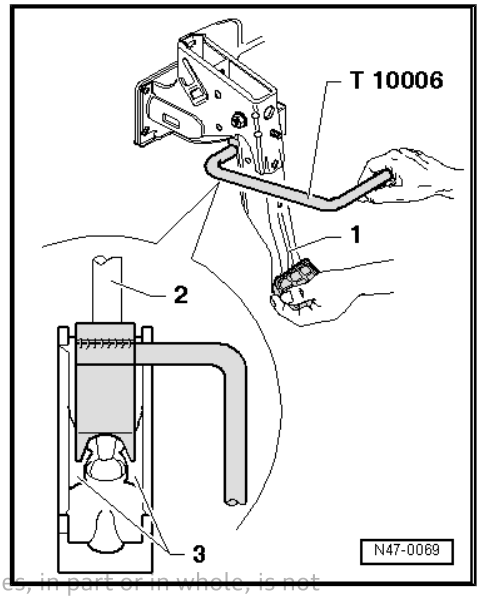
– First press brake pedal towards brake servo and hold in this position.

1 - Brake pedal

2 - Push rod

3 - Retaining lugs

– Insert release tool - T10006- as shown and pull towards driver's seat, at the same time holding brake pedal in position (the pedal must not move towards the rear). This will press the retaining lugs -3- of the mounting off the ball head of the push rod -2-.



For illustration purposes, the method of separating the brake pedal from the brake servo is shown with the pedal cluster removed.

– Pull release tool - T10006- and brake pedal together towards driver seat. (This will pull the brake pedal off the ball head of the push rod).

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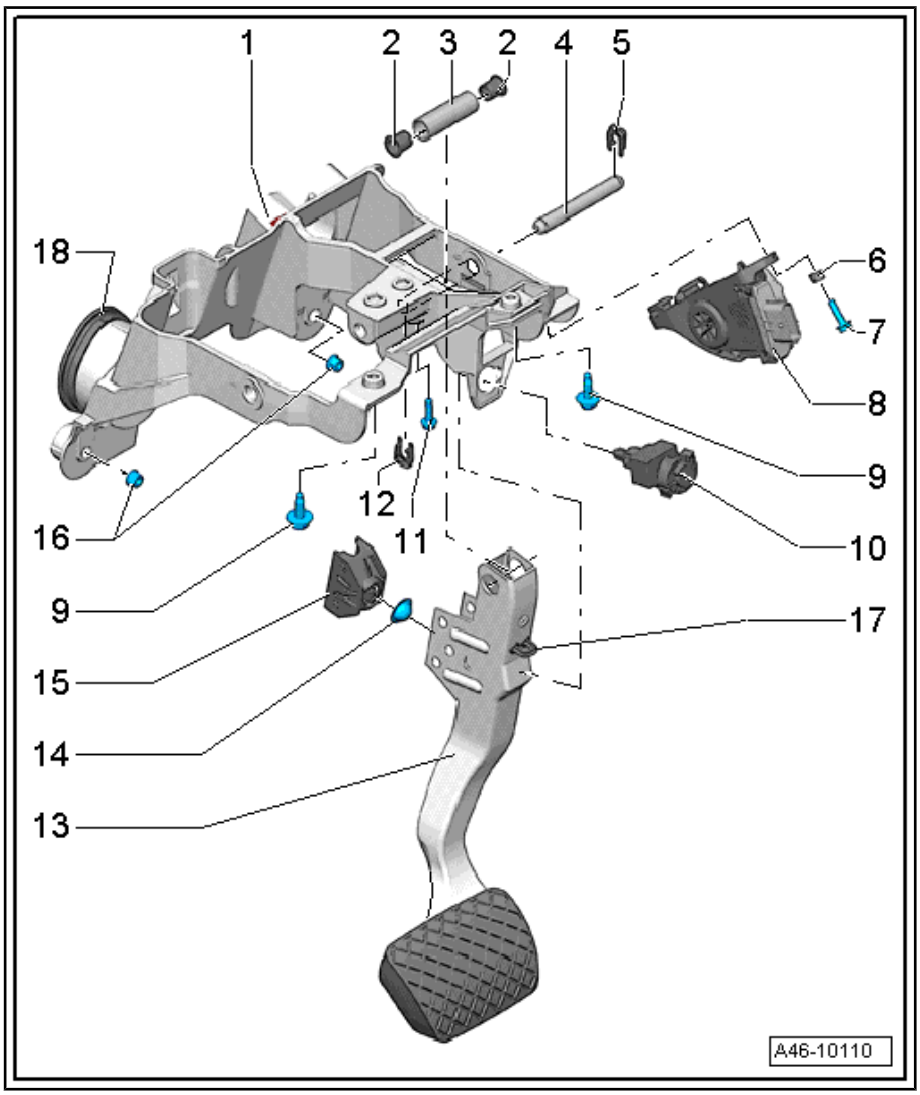
4.4 Connecting brake pedal to brake servo



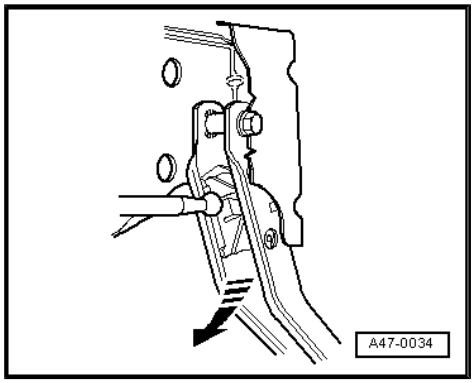
Note

If possible, stop -17- on brake pedal must always be left installed; otherwise mounting for brake light sensor -10- could break off if brake pedal is released too abruptly.

Take care not to damage stop -17- on brake pedal. Otherwise, there is a risk that mounting for brake light sensor -10- can break off when brake pedal is released.

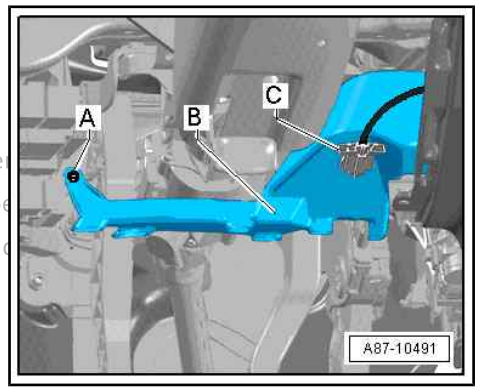
– Hold ball head of push rod in front of mounting and push brake pedal towards brake servo so that ball head audibly locks into place.

– Install brake light sensor ⇒ page 40 .



– Install footwell vent -A-.

– Plug in electrical connector -C- on footwell vent.



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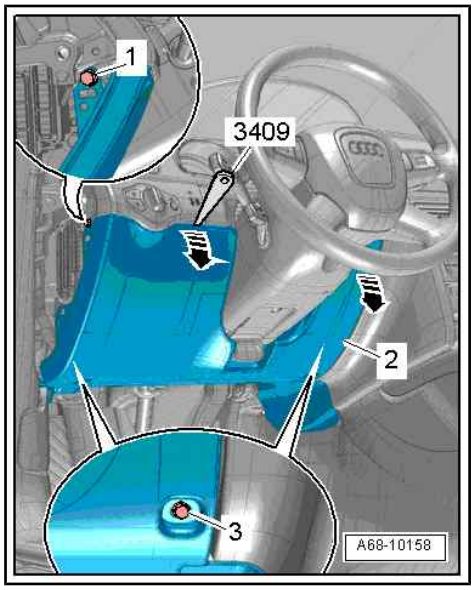
– Install driver's storage compartment -1 ... 3-.



4.5 Removing and installing brake pedal

⇒ “4.5.1 Removing and installing brake pedal - vehicles with manual gearbox”, page 173

⇒ “4.5.2 Removing and installing brake pedal - vehicles with automatic gearbox”, page 175

4.5.1 Removing and installing brake pedal - vehicles with manual gearbox

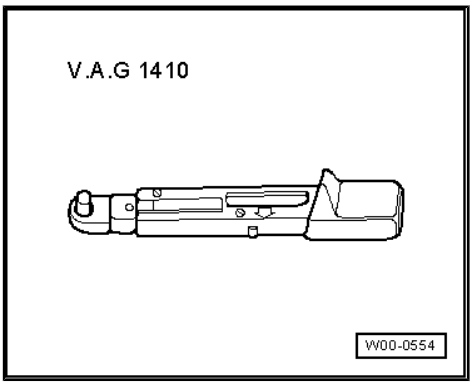
On vehicles with manual gearbox, the mounting bracket must be removed in order to remove the brake pedal.

– Remove mounting bracket (vehicles with manual gearbox) ⇒ page 149 .

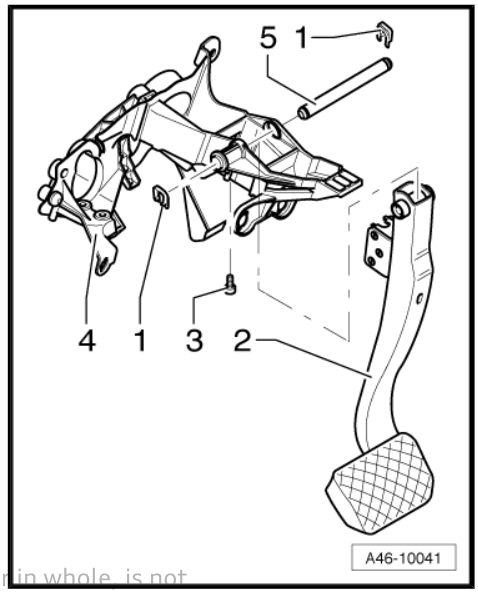
Removing brake pedal with mounting bracket removed

Special tools and workshop equipment required

♦ Torque wrench - V.A.G 1410-



– Remove bolt -3-.



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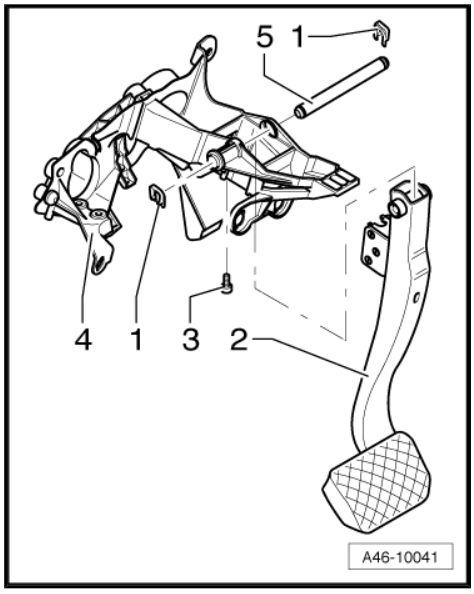
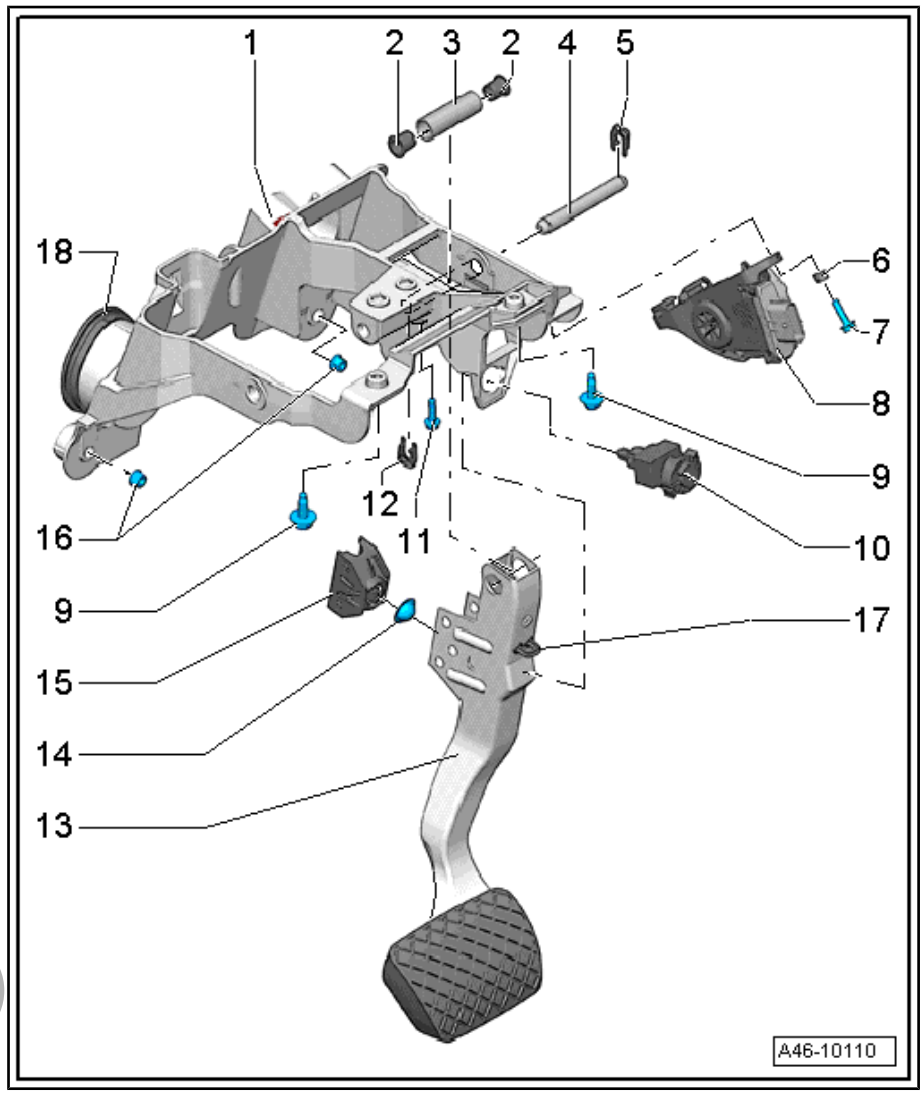
– Pull off retaining clip -1- on left side and pull out pin -5- to the right.
– Take out brake pedal.



Installing brake pedal with mounting bracket removed

WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.



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Note

If possible, stop -17- on brake pedal must always be left installed; otherwise mounting for brake light sensor -10- could break off if brake pedal is released too abruptly.

Take care not to damage stop -17- on brake pedal. Otherwise, there is a risk that mounting for brake light sensor -10- can break off when brake pedal is released.

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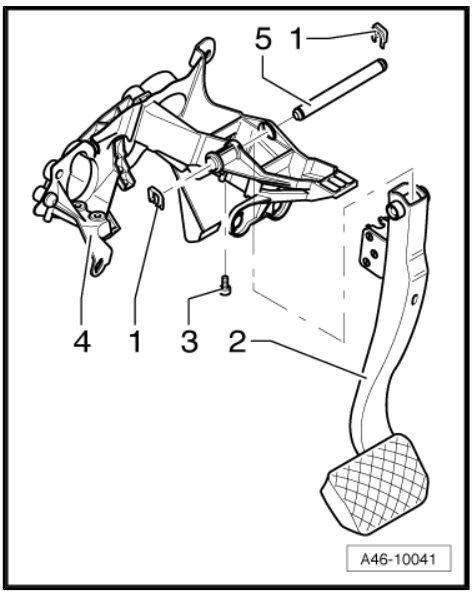
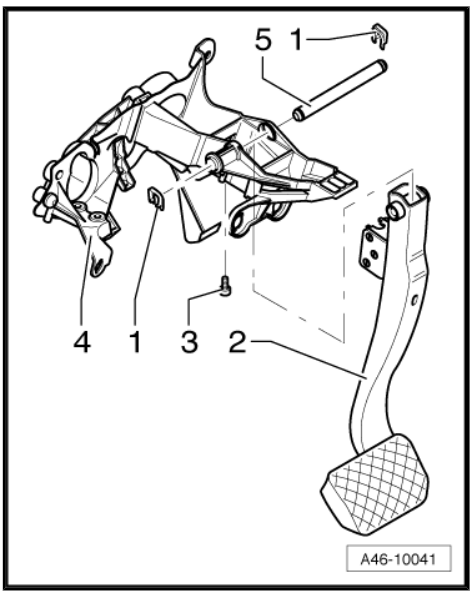
– Push retaining clip (right-side) onto pin.
– Slide pin from right to left through shaft in brake pedal.
– Secure pin with retaining clip -1- on left side.



The pin must be secured with the retaining clips on both sides.

– Fit bolt -3- and tighten.
– Install mounting bracket (vehicles with manual gearbox) ⇒ page 149 .

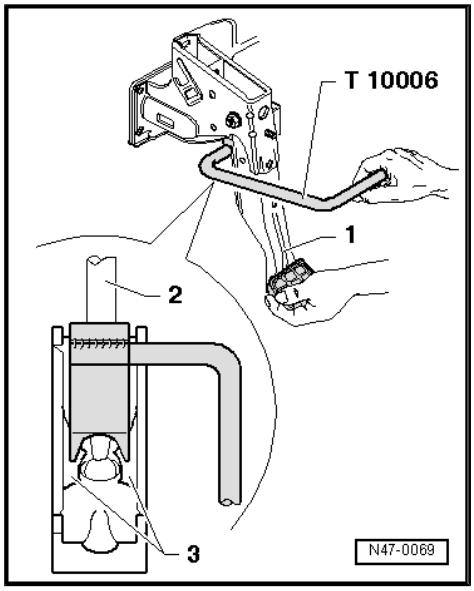


4.5.2 Removing and installing brake pedal - vehicles with automatic gearbox

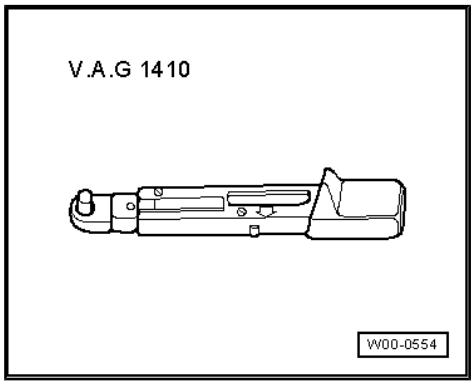
Special tools and workshop equipment required

♦ Release tool - T40168- for brake light sensor.

♦ Release tool - T10006-

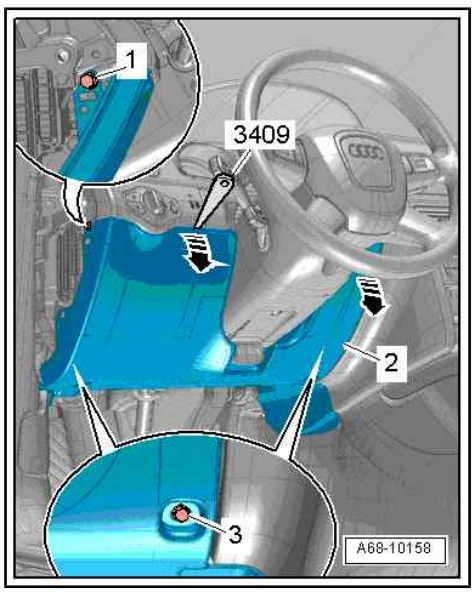


♦ Torque wrench - V.A.G 1410-



Removing

– Remove dash panel cover (driver side) -1 ... 3-.



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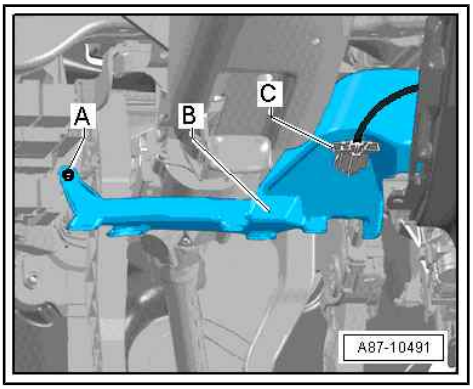
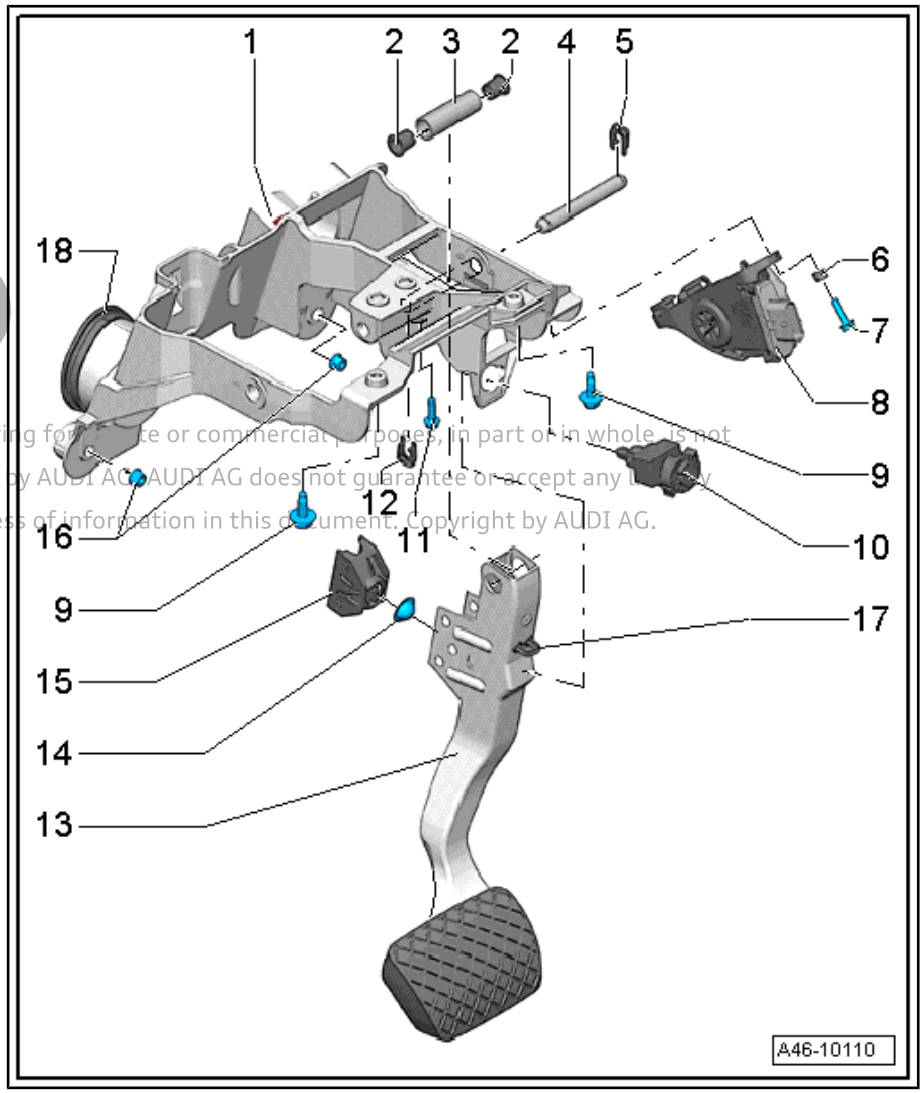
– Unplug electrical connector -C- on footwell vent.
– Remove footwell vent -A-.
– Remove brake light sensor ⇒ page 40 .
– Separate brake pedal from brake servo ⇒ page 169 .



WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

– Remove bolt -11-.



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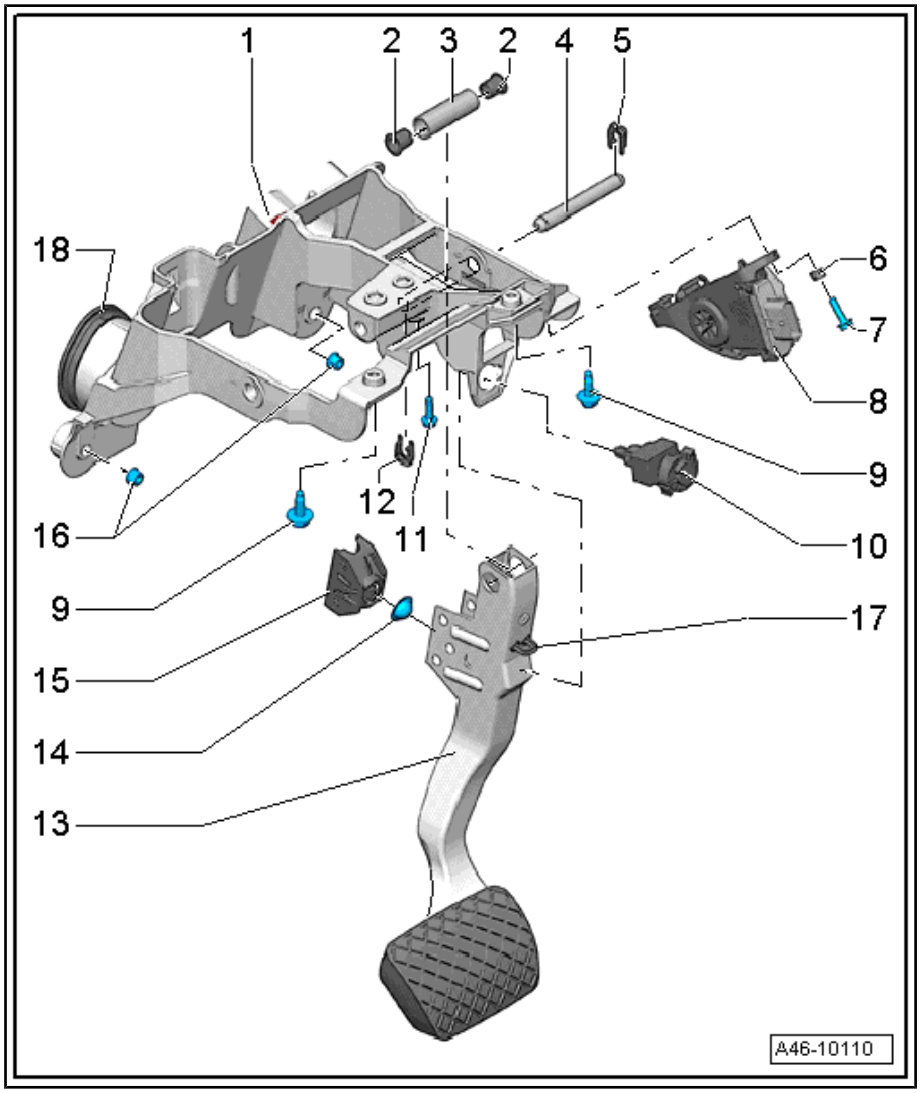
– Remove retaining clip -5- and pull out pin -4- towards the left.

Installing



Note

If possible, stop -17- on brake pedal must always be left installed; otherwise mounting for brake light sensor -10- could break off if brake pedal is released too abruptly.

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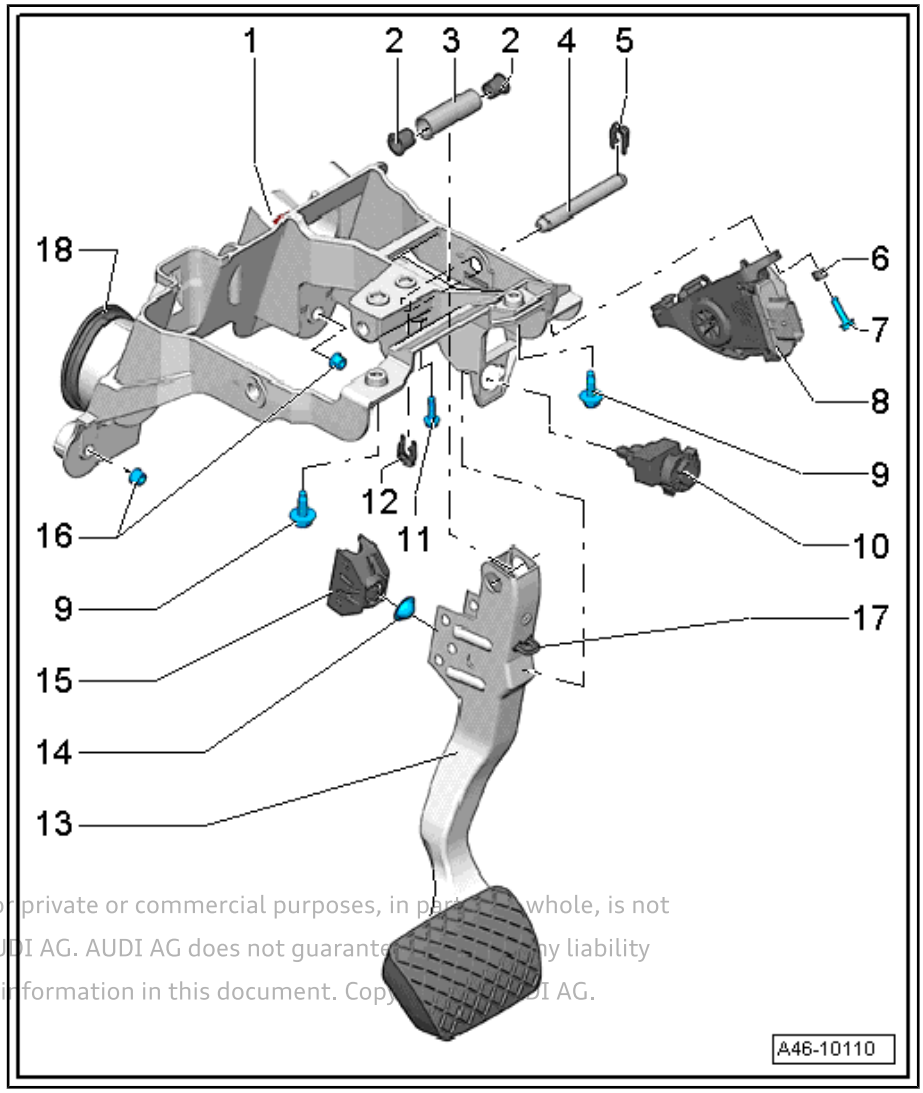
Take care not to damage stop -17- on brake pedal. Otherwise, there is a risk that mounting for brake light sensor -10- can break off when brake pedal is released.

– Push retaining clip (left-side) -12- onto pin.
– Slide pin from left to right through shaft in brake pedal.
– Secure pin with retaining clip -5- on right side.



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The pin must be secured with the retaining clips -5 and 12- on both sides.

– Fit bolt -11- and tighten.

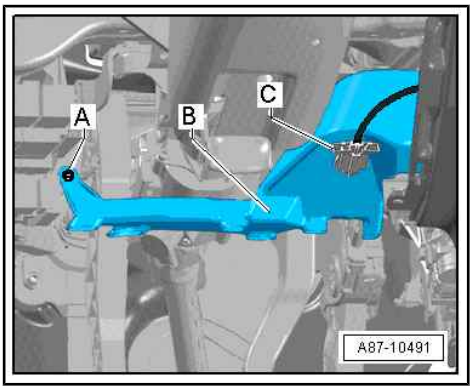
Attaching brake pedal to brake servo

– Hold ball head of push rod in front of mounting and push brake pedal towards brake servo so that ball head audibly locks into place.

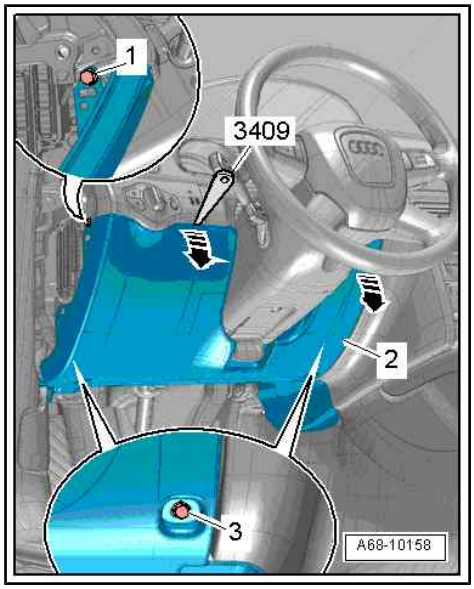
– Install brake light sensor ⇒ page 40 .

– Install footwell vent -A-B-.

– Plug in electrical connector -C- on footwell vent.



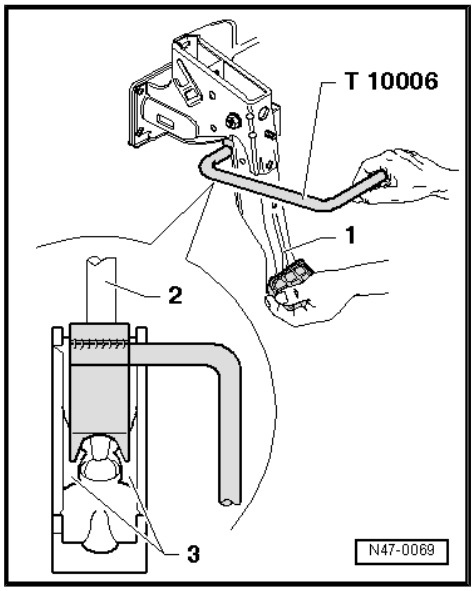
– Install dash panel cover (driver side) -1 ... 3-.



4.6 Removing and installing mounting for brake servo push rod

Special tools and workshop equipment required

- Release tool - T40168- for brake light sensor.
- Release tool - T10006-



Removing

WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

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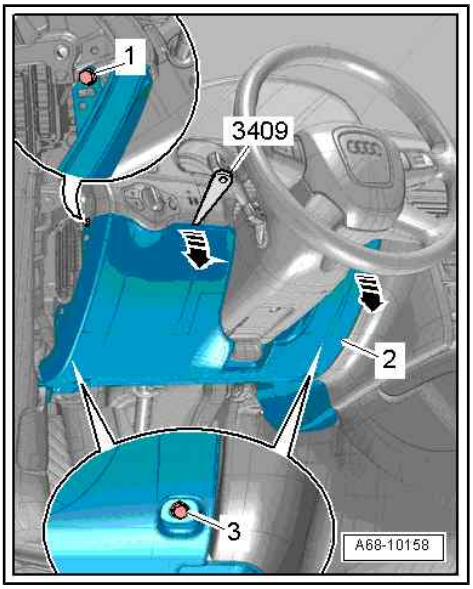
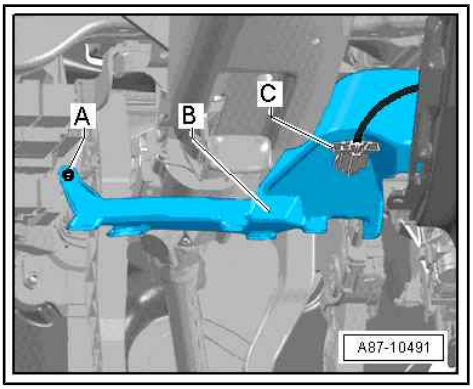
– Remove dash panel cover (driver side) -1 ... 3-.



– Unplug electrical connector -C- on footwell vent.
– Remove footwell vent -A-B-.
– Remove brake light sensor -10- ⇒ page 40 .



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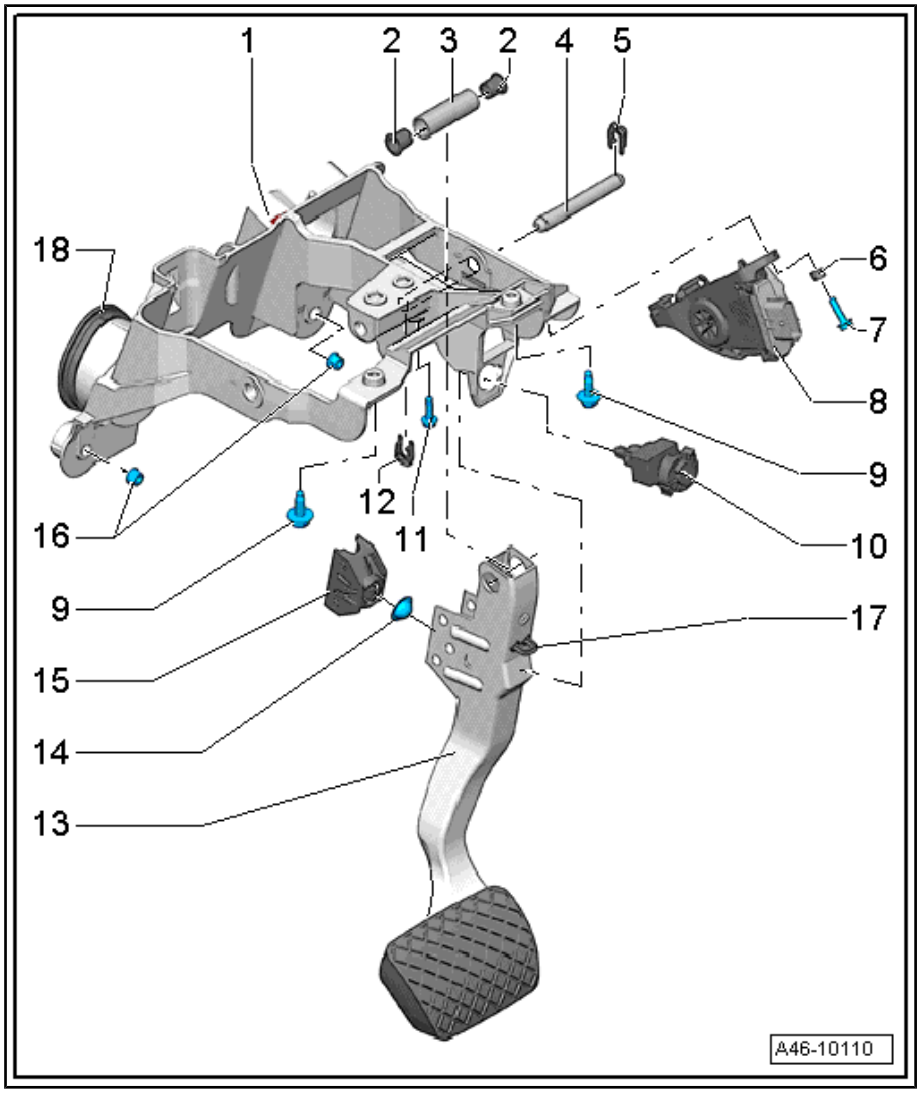

– Separate brake pedal from brake servo ⇒ page 169 .

WARNING

If possible, stop on brake pedal should always be left installed; otherwise mounting for brake light sensor could break off if brake pedal is released too abruptly.

– Using a suitable tool, pry mounting -15- for brake servo push rod out of brake pedal.

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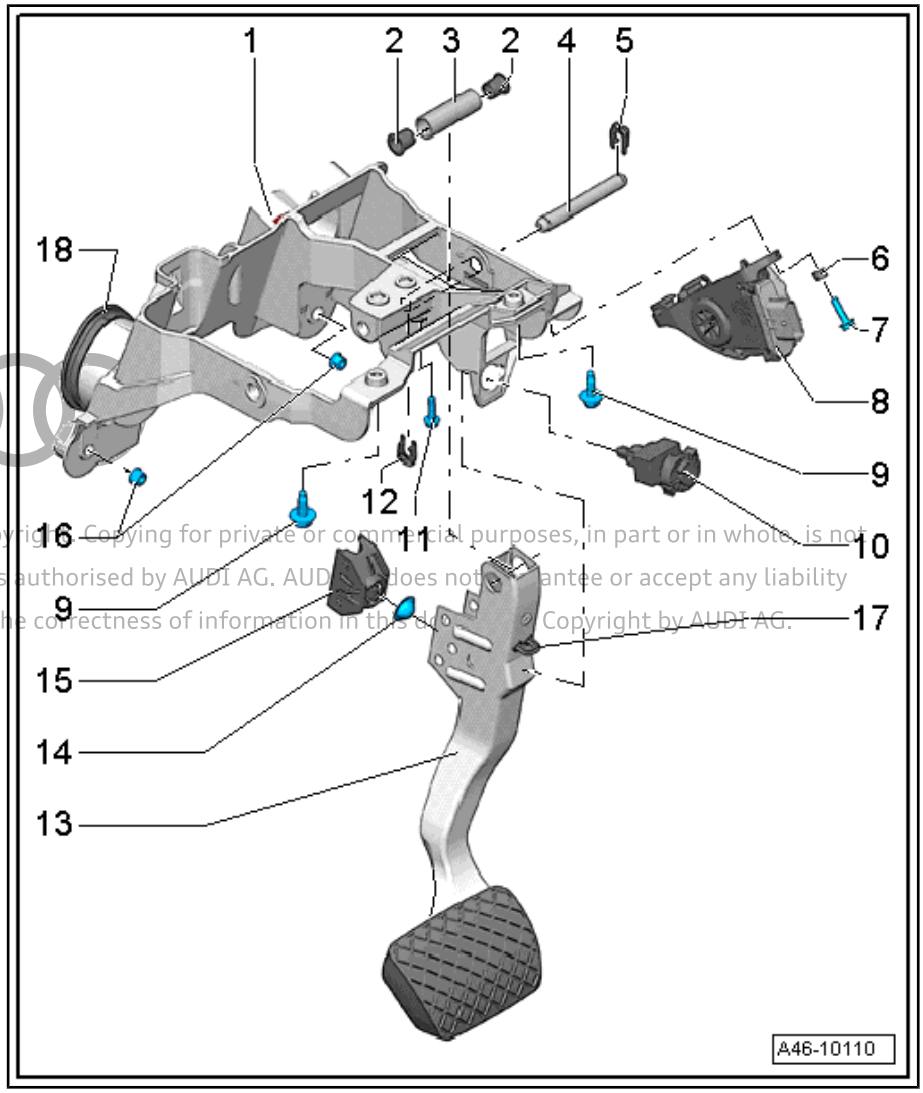

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Note

If possible, stop -17- on brake pedal should always be left installed; otherwise mounting for brake light sensor -10- could break off if brake pedal is released too abruptly.

Installing

– Fit mounting for brake servo push rod together with bearing shell into brake pedal.

The mounting must engage audibly.

Attaching brake pedal to brake servo

– Hold ball head of push rod in front of mounting and push brake pedal in direction of brake servo so that the ball head audibly locks into place.

– Install brake light sensor ⇒ page 40 .

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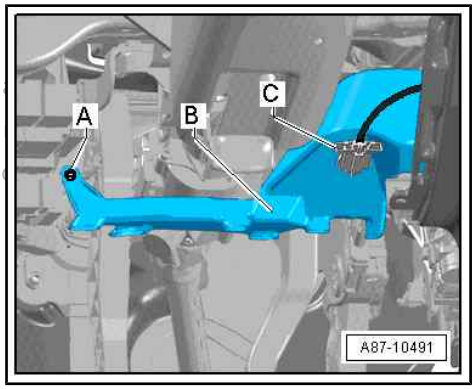
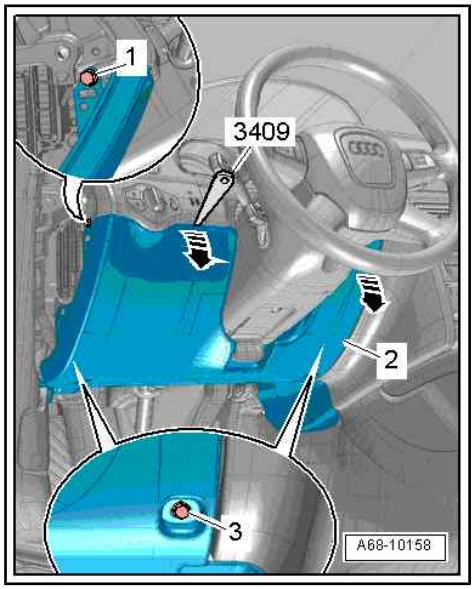
– Install footwell vent -A-B-.
– Plug in electrical connector -C- on footwell vent.



– Install dash panel cover (driver side) -1 ... 3-.



47 – Brakes - hydraulics

1 Front brake caliper

⇒ “1.1 Exploded view - front brake caliper”, page 185

⇒ “1.2 Removing and installing brake caliper piston”, page 191

⇒ “1.3 Renewing bearing bushes and guide pins”, page 197

1.1 Exploded view - front brake caliper

⇒ “1.1.1 Exploded view - front brake caliper (FN3/1LT)”, page 185

⇒ “1.1.3 Exploded view - front brake caliper (FBC/1LA/1LJ)”, page 187

⇒ “1.1.5 Exploded view - front brake caliper for ceramic brakes (1LW)”, page 189

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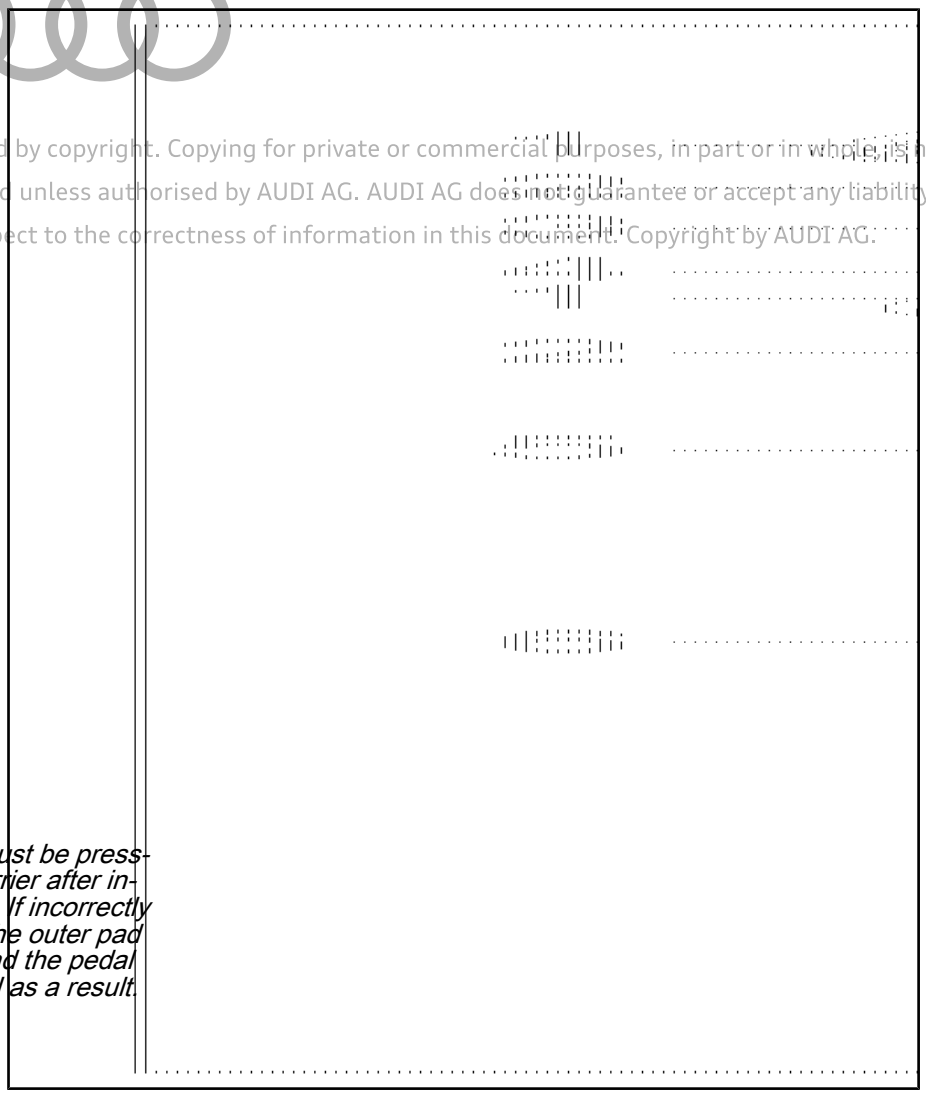
1.1.1 Exploded view - front brake caliper (FN3/1LT)

Note

- *Install complete repair kit when servicing.*
- *New brake calipers are filled with brake fluid and are pre-bled.*
- *Apply a thin coat of assembly paste - G 052 150 A2- to brake cylinders, pistons and seals.*



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1 - Caps

- ❑ Detach when removing guide pins
- ❑ Re-install after fitting guide pins

2 - Guide pin

- ❑ 30 Nm
- ❑ Renewing ⇒ page 197

3 - Bleeder valve

- ❑ Before screwing in, grease thread with thin coat of assembly paste - G 052 150 A2- .
- ❑ 13 Nm

4 - Protective cap

- ❑ Push onto bleeder valve

5 - Brake caliper housing

6 - Retaining spring

- ❑ Insert with both ends in the holes in brake caliper housing

Note

The retaining spring must be pressed under the brake carrier after inserting into both holes. If incorrectly installed, the wear of the outer pad cannot be adjusted, and the pedal travel will be increased as a result.

7 - Bearing bush

- ❑ Insert into brake caliper housing
- ❑ Renewing ⇒ page 197

8 - Brake carrier

- ❑ Bolt to brake caliper housing

9 - Seal

- ❑ ⇒ “1.1.2 Removing protective cap and seal”, page 186

10 - Piston

- ❑ Apply a thin coat of assembly paste - G 052 150 A2- to piston before inserting
- ❑ Diameter 57 mm

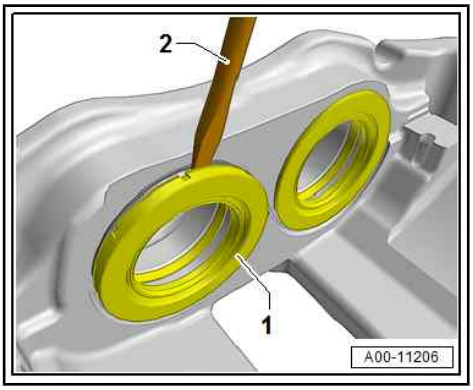
11 - Protective cap

- ❑ Do not damage when inserting piston
- ❑ ⇒ “1.1.2 Removing protective cap and seal”, page 186

1.1.2 Removing protective cap and seal

Removal tool - VAS 40338-

– Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



1.1.3 Exploded view - front brake caliper (FBC/1LA/1LJ)

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Note

- *Install complete repair kit when servicing.*
- *Apply a thin coat of assembly paste - G 052 150 A2- to brake cylinder, piston and seal.*

1 - Bolt
- ❑ 30 Nm

2 - Protective cap
- ❑ Insert in brake caliper
- ❑ Renewing ⇒ page 198

3 - Guide pin
- ❑ Slide through sleeve
- ❑ Renewing ⇒ page 198

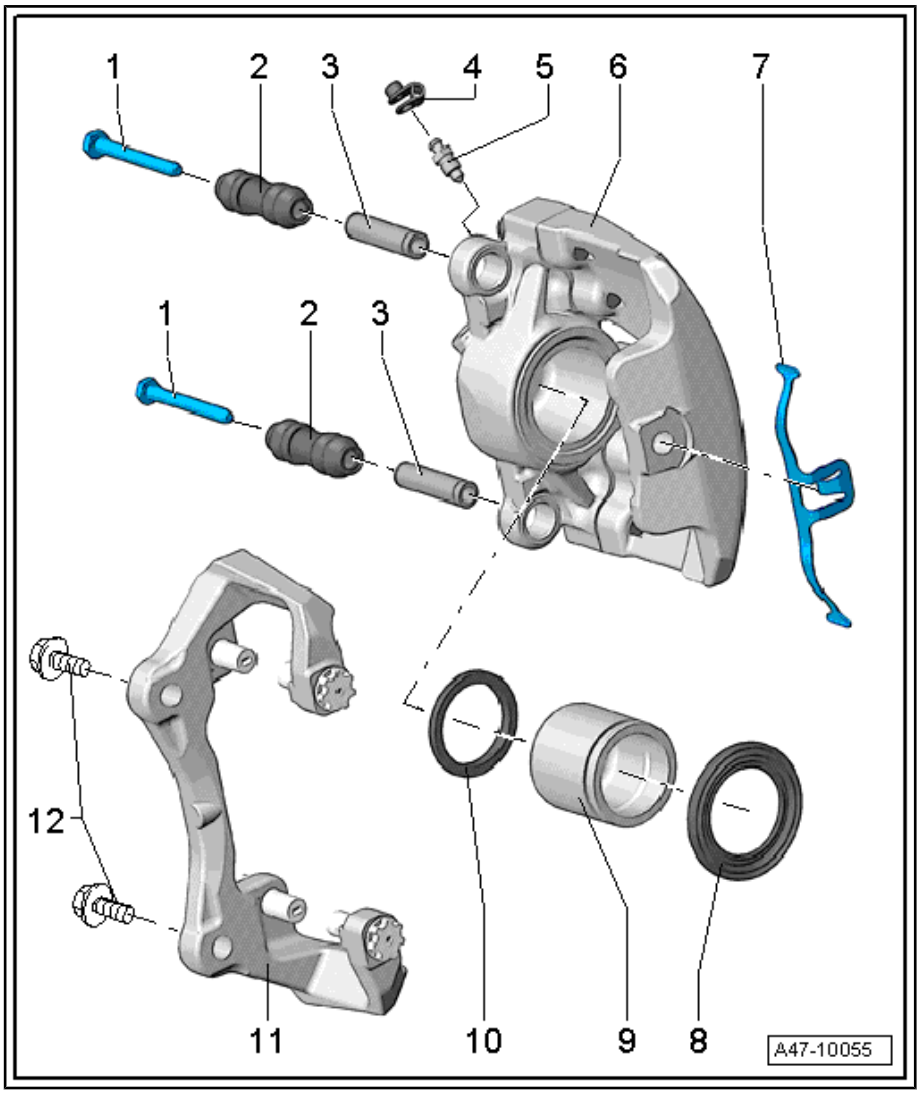
4 - Protective cap
- ❑ Push onto bleeder valve

5 - Bleeder valve
- ❑ Before screwing in, grease thread with thin coat of assembly paste - G 052 150 A2- .
- ❑ 15 Nm

6 - Brake caliper housing

7 - Retaining spring
- ❑ Ensure correct installation position

8 - Protective cap
- ❑ Do not damage when inserting piston
- ❑ Grease with assembly paste - G 052 150 A2- .
- ❑ ⇒ “1.1.4 Removing protective cap and seal”,



page 188

9 - Piston

- ❑ Apply a thin coat of assembly paste - G 052 150 A2- to piston before inserting
- ❑ Diameter 57 mm
- ❑ ⇒ “1.1.4 Removing protective cap and seal”, page 188

10 - Seal

- ❑ Grease with assembly paste - G 052 150 A2-
- ❑ ⇒ “1.1.4 Removing protective cap and seal”, page 188

11 - Brake carrier

- ❑ Removing and installing ⇒ page 83
- ❑ The retaining pins (4x) for the brake pads on the brake carrier must NOT be slackened

12 - Bolt

- ❑ 196 Nm

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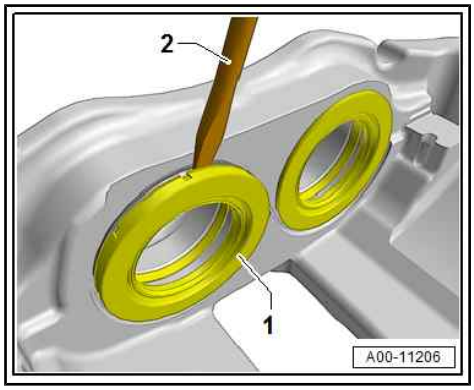
1.1.4 Removing protective cap and seal

Removal tool - VAS 40338-

– Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



1.1.5 Exploded view - front brake caliper for ceramic brakes (1LW)

1 - Bolts for brake caliper

Note

These bolts do not have to be slackened in order to remove the brake caliper or change the brake pads.

4 - Brake caliper

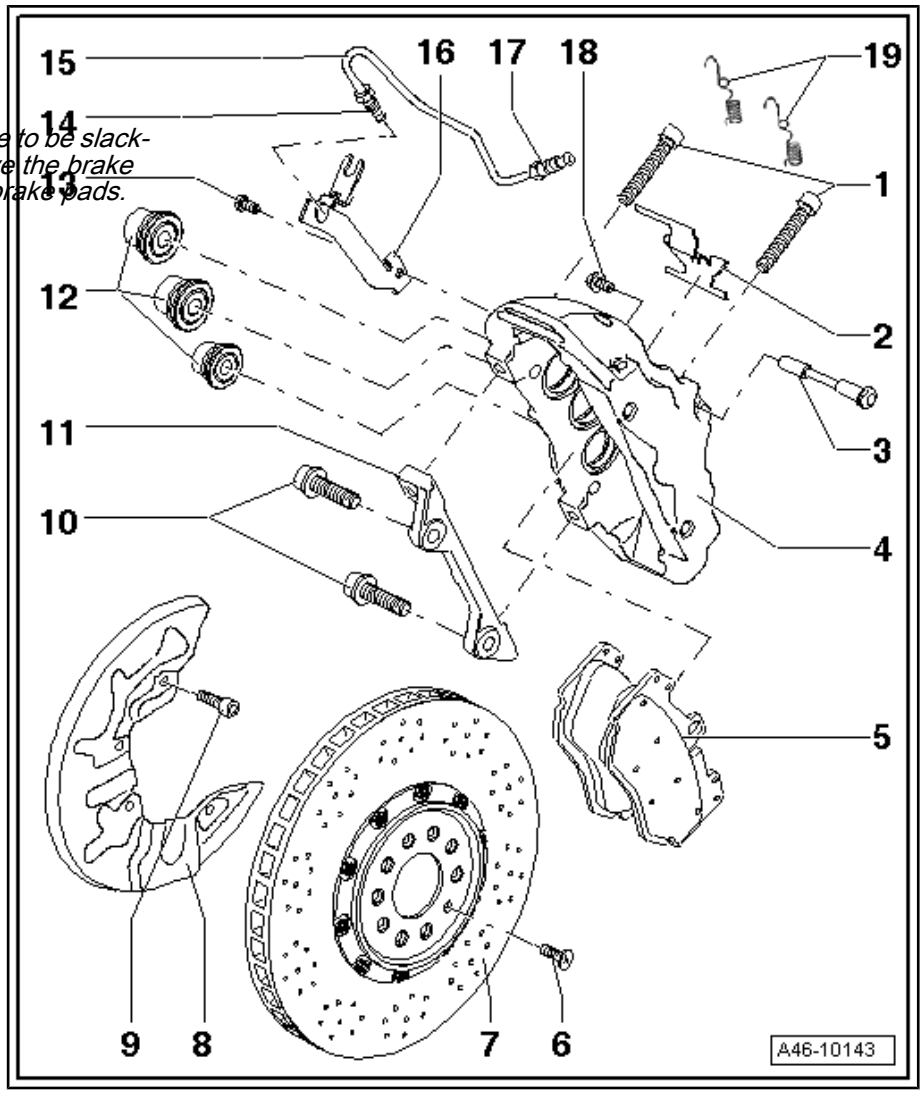
- If assembly work is required, do not leave caliper hanging from brake hose but secure it to body with wire
- With the exception of “Removing and installing brake pads”, “Removing and installing brake caliper” and “Removing and installing brake pistons”, no repairs may be performed on the brake caliper
- Do not twist hose when installing

10 - Ribbed bolt

- Tightening torque: 196 Nm
- Clean ribs if using again

11 - Brake carrier

- Bolt to wheel bearing



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housing

12 - Brake piston

WARNING

The brake pistons have different diameters. When re-installing, please make sure that each of the brake pistons is inserted in the correct aperture in the brake caliper. The ceramic inserts on the brake piston act as heat insulators and must not be separated from the brake piston. If the ceramic insert is damaged, the brake pistons must be renewed for safety reasons.

- ❑ ⇒ “1.1.6 Removing protective cap and seal”, page 190

14 - Brake line connection at brake pipe

- ❑ Tightening torque: 14 Nm
- ❑ Brake hose must not be twisted.

15 - Brake line

- ❑ Screw into brake caliper housing
- ❑ Screw into brake hose, counter hold on brake hose hexagon.
- ❑ Do not twist hose when fitting
- ❑ Ensure that lugs are properly seated in grooves in bracket.

16 - Bracket for brake line

- ❑ Bolt to brake caliper housing
- ❑ Attach brake line

17 - Brake pipe in brake caliper

- ❑ 16 Nm

Note

Tighten bleeder screws to 15 Nm.

1.1.6 Removing protective cap and seal

Removal tool - VAS 40338-

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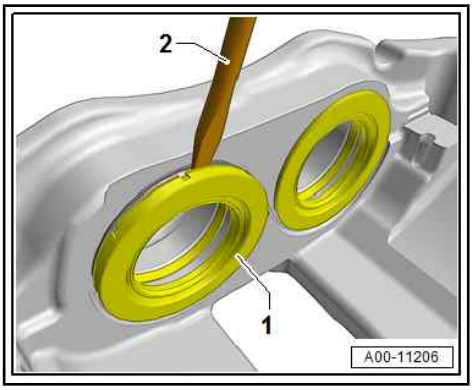
– Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



1.2 Removing and installing brake caliper piston

⇒ “1.2.1 Removing and installing brake caliper piston (1LT)”, page 191

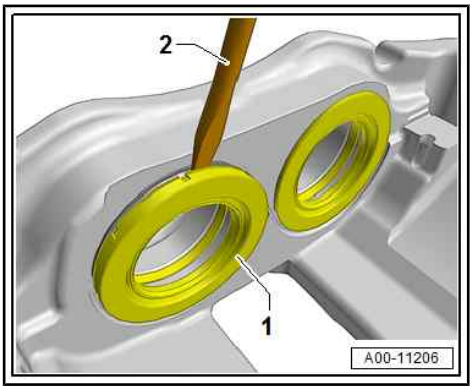
⇒ “1.2.2 Removing and installing brake caliper pistons (1LA/1LJ)”, page 193

⇒ “1.2.3 Removing and installing brake caliper pistons for ceramic brakes (1LW)”, page 195

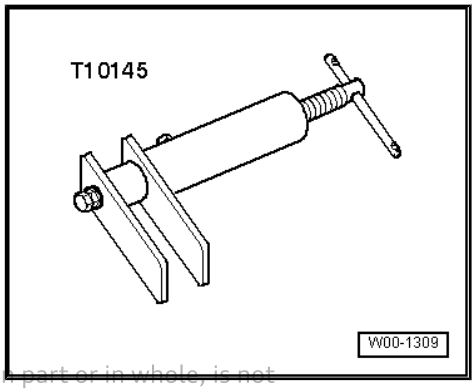
1.2.1 Removing and installing brake caliper piston (1LT)

Special tools and workshop equipment required

- Assembly paste - G 052 150 A2-
- Removal tool - VAS 40338-
- Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



- Piston resetting appliance - T10145-



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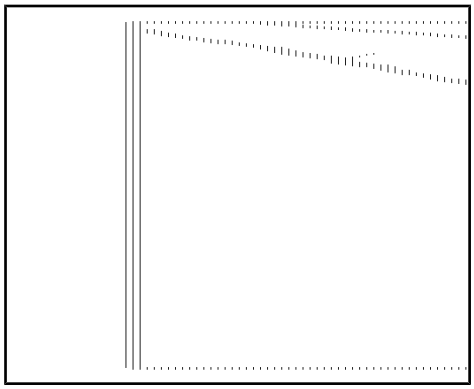
Removing

– Force piston out of brake caliper housing using compressed air.



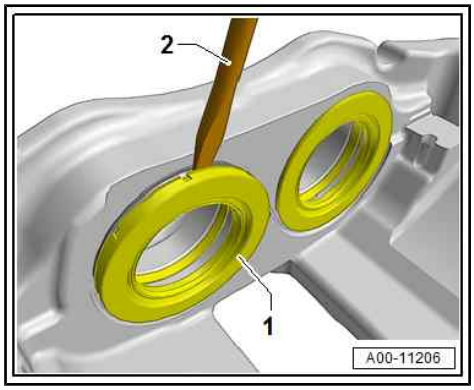
Note

Place a piece of wood in the recess to prevent damaging the piston.

Removal tool - VAS 40338-

– Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.

– Take out seal.

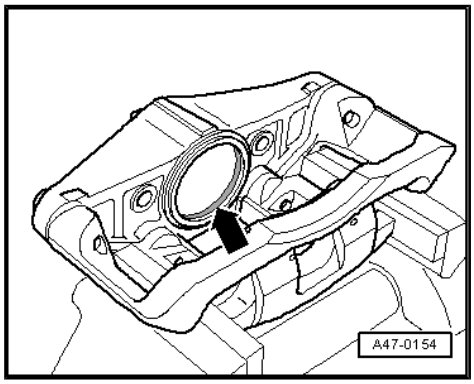


Note

When removing ensure that the bore of the cylinder is not damaged.

Installing

– Insert inner seal into groove -arrow- in brake caliper.



– Push protective cap onto brake caliper housing and press it in so that it makes contact all round.

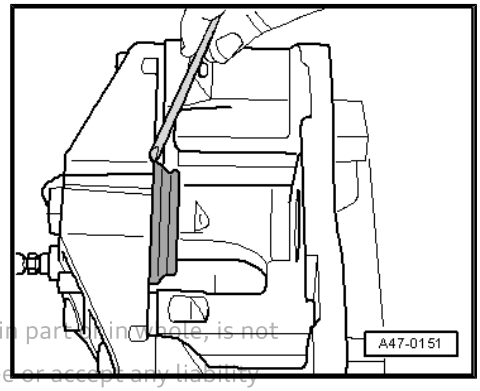
– At this stage it should not be possible to remove the protective cap from the brake caliper housing by hand.

– Apply a thin coat of assembly paste - G 052 150 A2- to piston and seal before inserting.

– Press brake piston lightly against protective cap.

Keep the piston straight to avoid damaging the seal.

– Inflate protective cap with compressed air (maximum 3 bar). The protective cap will then locate around the brake piston.



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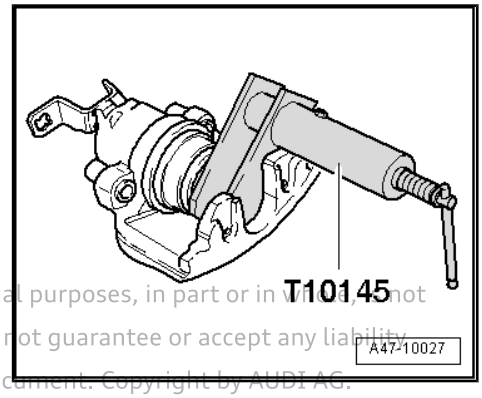
– Press brake piston into caliper using piston resetting appliance - T10145- .



Keep the piston straight to avoid damaging the seal.

Note

The inner sealing lip on the protective cap will then locate in the piston groove.

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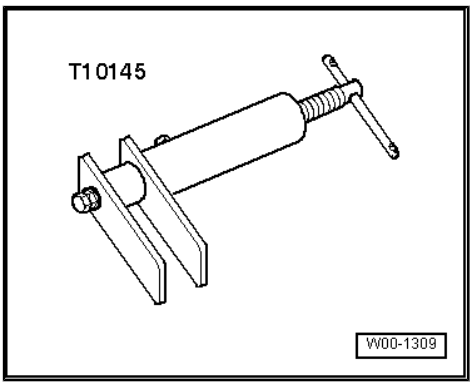
1.2.2 Removing and installing brake caliper pistons (1LA/1LJ)

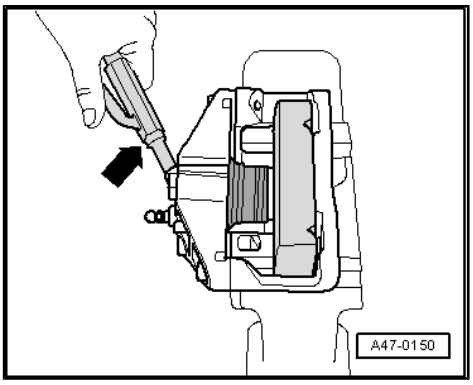
Removing

Special tools and workshop equipment required

- Assembly paste - G 052 150 A2-
- Removal tool - VAS 40338-
- Piston resetting appliance - T10145-



– Force piston out of brake caliper housing using compressed air.

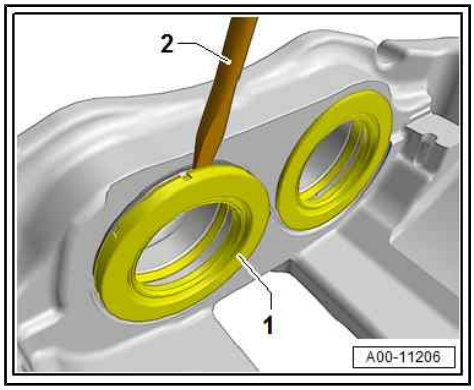


Note

Place a piece of wood in the recess to prevent damaging the piston.

Removal tool - VAS 40338-

– Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.
– Take out seal.

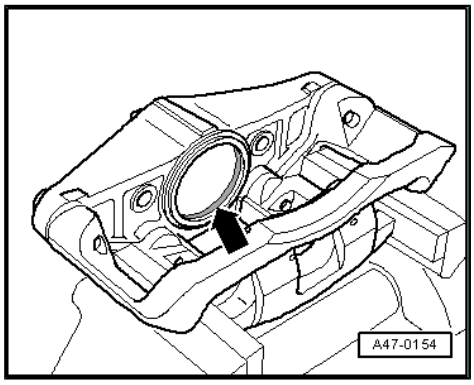


Note

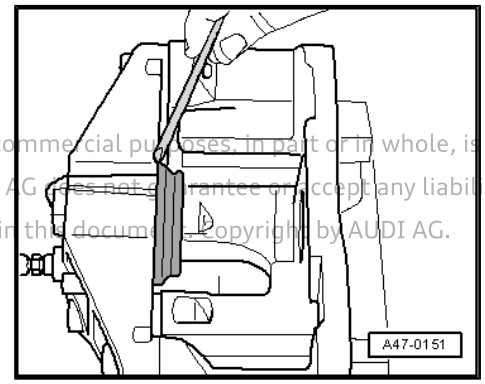
When removing ensure that the bore of the cylinder is not damaged.

Installing

– The surface of the piston and seal should be cleaned using only methylated spirits and then dried.
– Apply a thin coat of assembly paste - G 052 150 A2- to piston and seal before inserting.
– Insert inner seal into groove -arrow- in brake caliper.

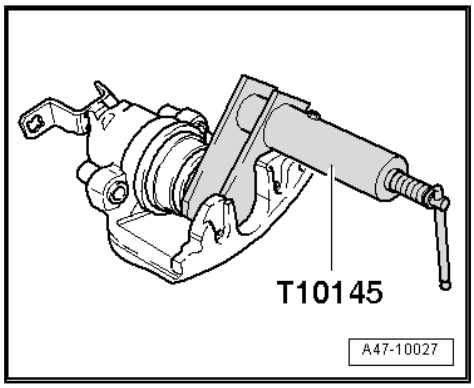


– Push protective cap onto brake caliper housing and press it in so that it makes contact all round.
– At this stage it should not be possible to remove the protective cap from the brake caliper housing by hand.
– Apply a thin coat of assembly paste - G 052 150 A2- to piston and seal before inserting.
– Press brake piston lightly against protective cap.



Keep the piston straight to avoid damaging the seal.

– Inflate protective cap with compressed air (maximum 3 bar). The protective cap will then locate around the brake piston.
– Press brake piston into caliper using piston resetting appliance - T10145- .



Keep the piston straight to avoid damaging the seal.

Note

The inner sealing lip on the protective cap will then locate in the piston groove.

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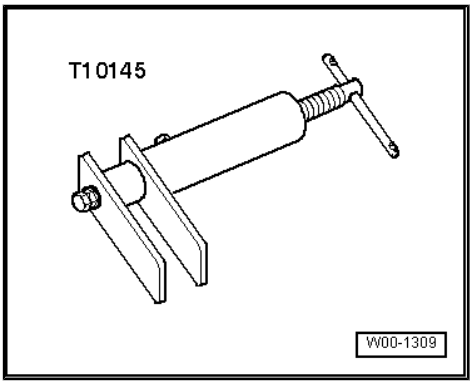
1.2.3 Removing and installing brake caliper pistons for ceramic brakes (1LW)

Special tools and workshop equipment required

- Removal tool - VAS 40338-
- Piston resetting appliance - T10145-



- Lithium grease - G 052 150 A2-

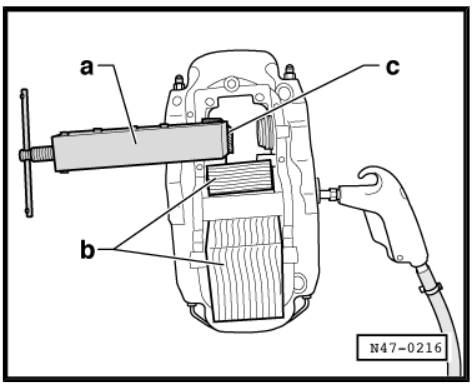
Removing

- Brake caliper removed
- Removing brake caliper (ceramic brakes) ⇒ page 85

– Force pistons out of brake caliper housing one at a time using compressed air.

The pistons can only be removed one at a time. Hold the opposite piston in the caliper housing with piston resetting appliance -a-. Use blocks of wood or similar -b- to keep the other pistons in place. Also place a piece of wood -c- against the resetting tool to prevent the piston from being damaged when it is forced out.

Removal tool - VAS 40338-



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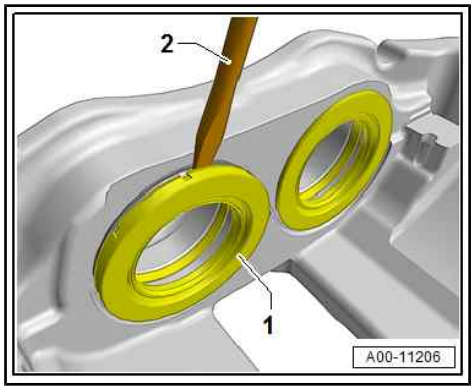
– Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



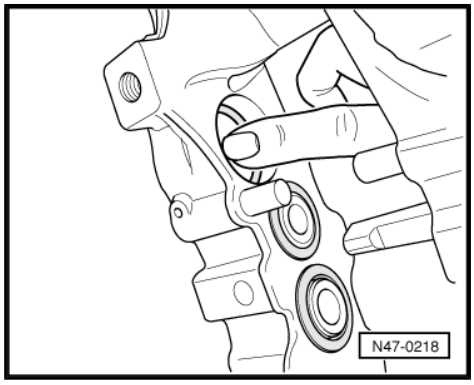
When removing ensure that the bore of the cylinder is not damaged.

Installing

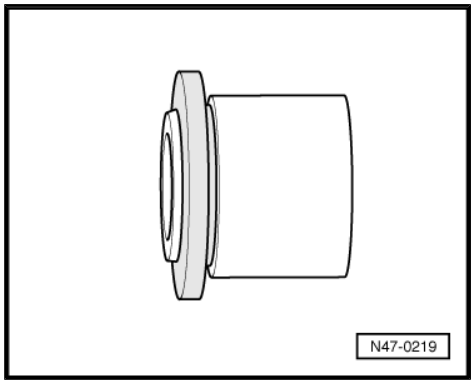
WARNING

The brake pistons have different diameters. When re-installing, please make sure that each of the brake pistons is inserted in the correct aperture in the brake caliper. The ceramic inserts on the brake piston act as heat insulators and must not be separated from the brake piston. If the ceramic insert is damaged, the brake pistons must be renewed for safety reasons.

– The surface of the piston and seal should be cleaned using only methylated spirits and then dried.
– Apply a thin coat of lithium grease - G 052 150 A2- to piston and seal before inserting.
– Insert the seal into the brake caliper housing.



– Fit protective cap onto piston.



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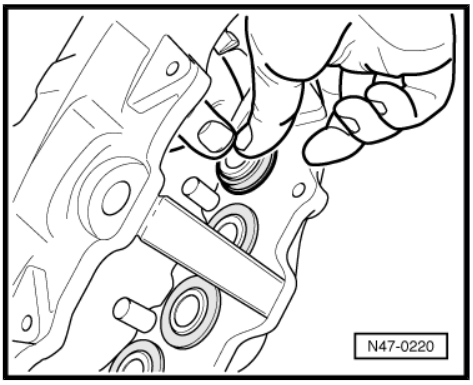
– Push piston into caliper housing, exerting even pressure.

The protective cap must fit securely in the groove; if necessary, apply additional pressure with piston resetting appliance.



– Install brake caliper (ceramic brakes) ⇒ page 85 .

Note

- *Brake pipe in brake caliper: 19 Nm*
- *Brake line connection at brake pipe: 14 Nm*

– Bleed brake system ⇒ “6 Hydraulic system”, page 248 .

Caution

Make sure that the brakes work properly before the vehicle is driven on the road.

1.3 Renewing bearing bushes and guide pins

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⇒ “1.3.1 Renewing bearing bushes and guide pins (1LT)”, page 197

⇒ “1.3.2 Renewing bearing bushes and guide pins (FBC/1LA/1LJ)”, page 198

1.3.1 Renewing bearing bushes and guide pins (1LT)

Note

Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.

Removing

– Unscrew pins -12- on brake caliper.

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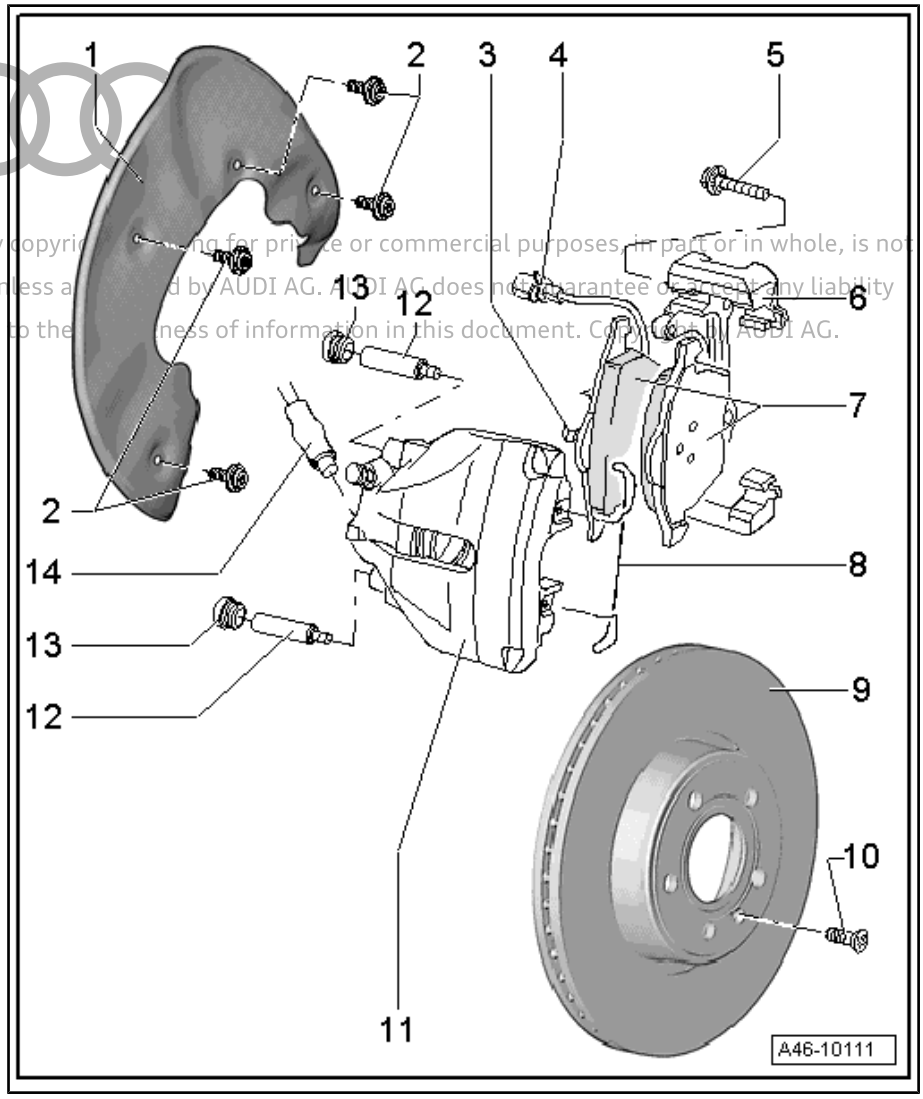


– Detach brake caliper.

Do not leave brake caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

– Pull bearing bushes out of brake caliper.

Installing

Installation is carried out in reverse sequence.

– Use new guide pins.

1.3.2 Renewing bearing bushes and guide pins (FBC/1LA/1LJ)

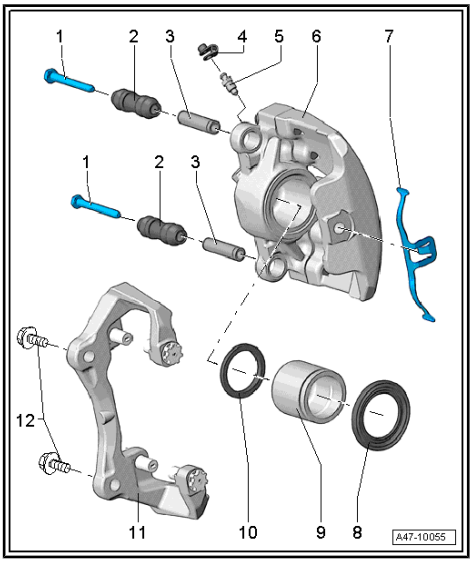
The guide pins must be removed if the protective caps are damaged.

Removing

Note

Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.

– Press down centre of retaining spring -7-.



Note

- *The spring is under tension; hold your hand over the spring to avoid risk of injury.*
- *When removing the spring, take care not to scratch or chip the paint on the brake caliper.*

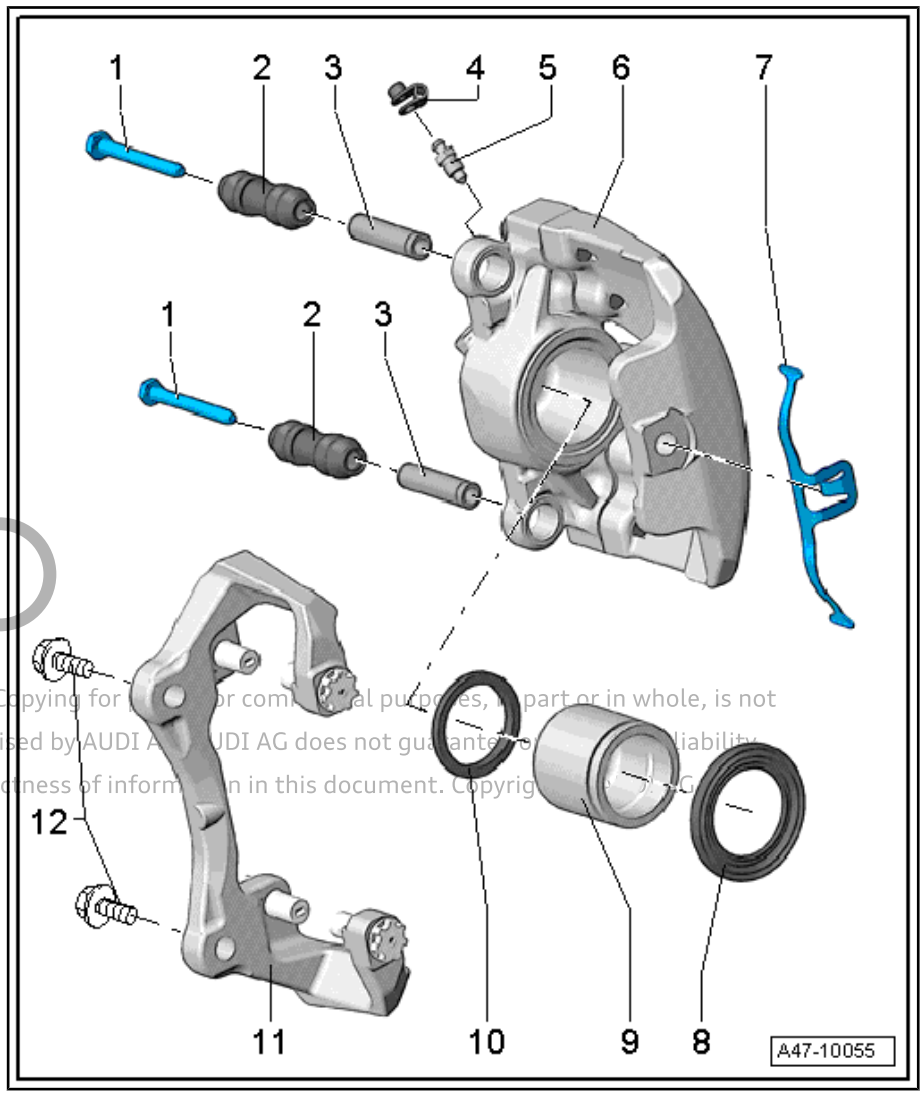
– Carefully detach retaining spring.

– Remove bolts -1- on brake caliper.

– Detach brake caliper.

Do not leave brake caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

– Pull outer part of protective cap -2- out of groove on guide pin.



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– Pull guide pin -3- outwards out of protective cap.

– Pull protective cap out of brake caliper.

Installing

– Carefully push guide pin into protective cap as far as first groove.

– Fit protective cap in brake caliper.

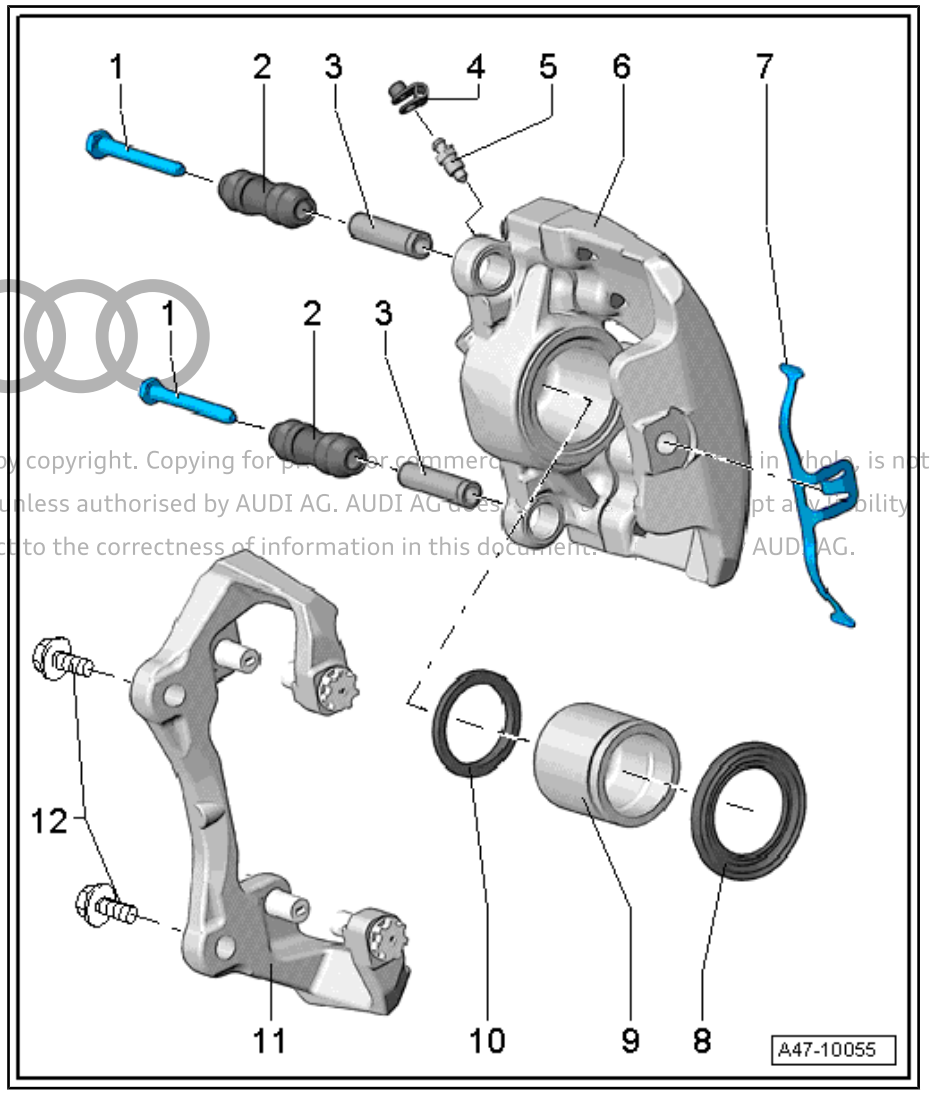
The protective cap must be seated centrally in the brake caliper.

– Push guide pin through protective cap.

The protective cap must now be seated in both grooves on the guide pin.

Check that both guide pins move freely. It should be possible to slide both guide pins in and out.

– Install brake caliper and tighten bolts -1-: 30 Nm.



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– Fit retaining spring -7- on outer brake pad.

– Press down centre of retaining spring and fit centre tab of spring in hole -arrow- in brake caliper.

The tab of the retaining spring must be seated properly in the hole in the brake caliper, otherwise the spring can become detached and the pad would not be secured.

Note

- *The spring is under tension; hold your hand over the spring to avoid risk of injury.*
- *When fitting the spring, take care not to scratch or chip the paint on the brake caliper.*

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2 Rear brake caliper

⇒ “2.1 Exploded view - rear brake caliper”, page 202

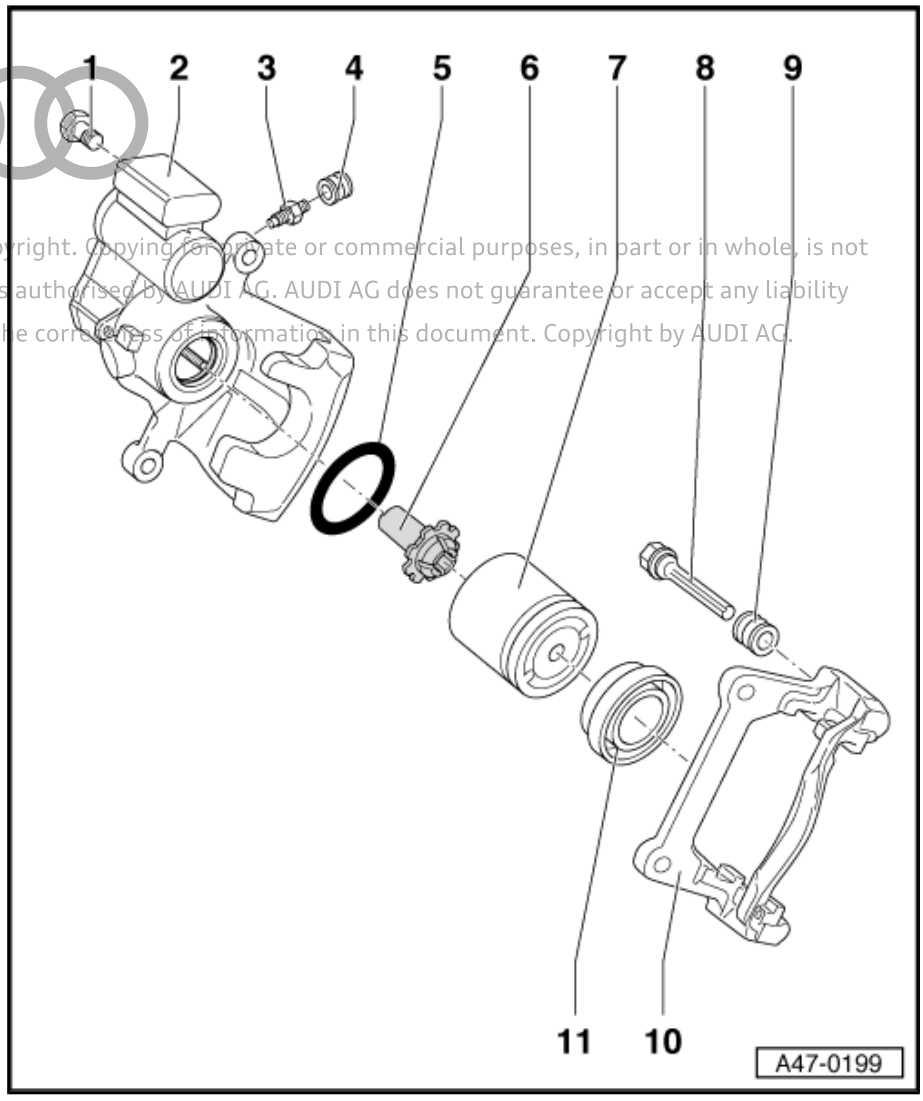
⇒ “2.2 Removing and installing brake caliper piston”, page 203

⇒ “2.3 Renewing bearing bushes and guide pins”, page 206

2.1 Exploded view - rear brake caliper

Note

- *When carrying out repairs install all parts supplied in repair kit.*
- *Apply a thin coat of assembly paste - G 052 150 A2- to brake cylinder, piston and seal.*



1 - Self-locking bolt
- ❑ 35 Nm
- ❑ Always renew
- ❑ Counterhold on guide pin when loosening and tightening

2 - Brake caliper housing with actuator

3 - Bleeder valve
- ❑ 13 Nm

4 - Grease cap
- ❑ Fit onto bleeder valve

5 - Seal
- ❑ Removing and installing ⇒ page 203

6 - Compressor nut
- ❑ To operate the parking brake

7 - Piston
- ❑ Removing and installing ⇒ page 203

8 - Guide pin
- ❑ Lubricate before installing protective cap
- ❑ Replacement parts are supplied with sufficient grease
- ❑ Renewing ⇒ page 206

9 - Protective cap
- ❑ Fit onto brake carrier

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and guide pin

- ❑ Renewing ⇒ “2.3 Renewing bearing bushes and guide pins”, page 206

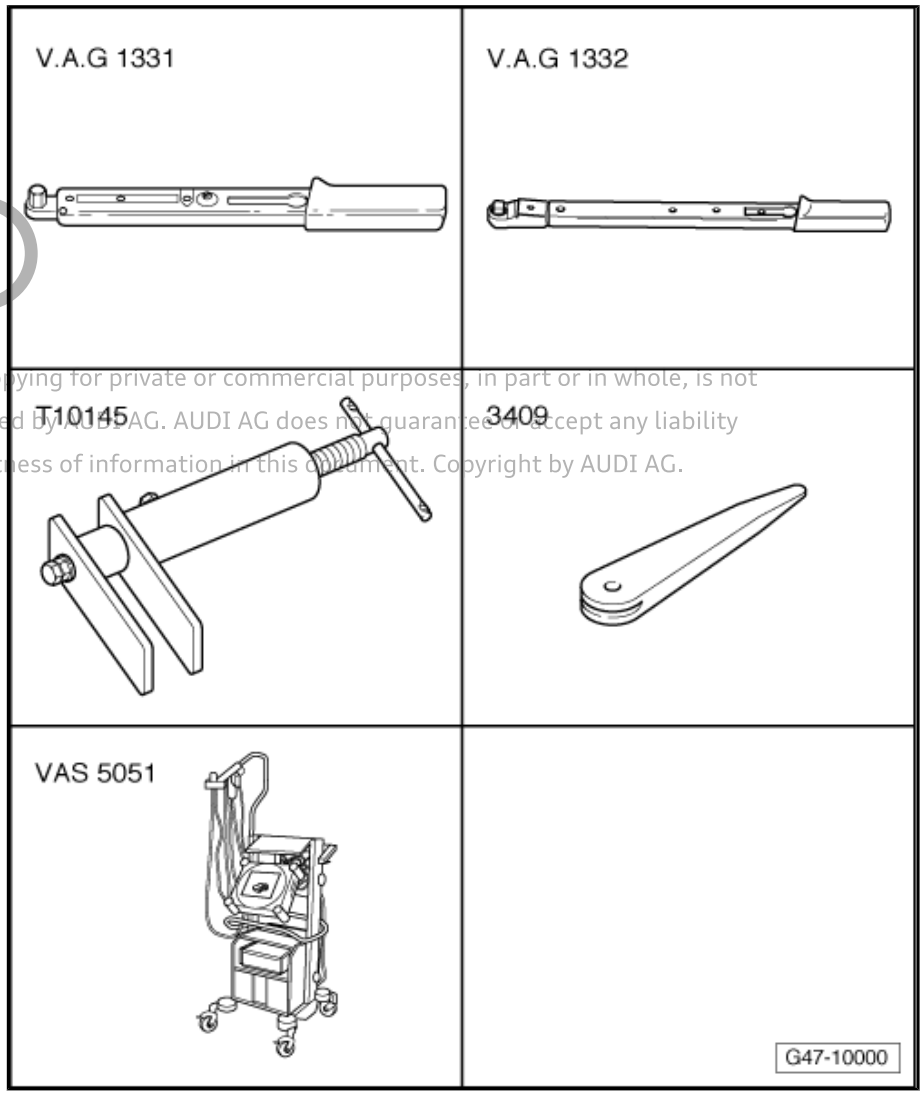
10 - Brake carrier with guide pins and protective caps

- ❑ Replacement carriers are supplied assembled and with sufficient grease on guide pins
- ❑ If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate the guide pins.

11 - Protective cap

- ❑ Removing and installing ⇒ “2.2 Removing and installing brake caliper piston”, page 203
- ❑ Fit outer sealing lip onto piston

2.2 Removing and installing brake caliper piston



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Special tools and workshop equipment required

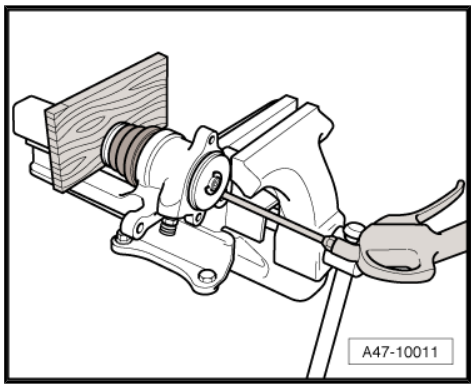
- ♦ Torque wrench - V.A.G 1331-
- ♦ Torque wrench - V.A.G 1332-
- ♦ Piston resetting appliance - T10145-
- ♦ Removal wedge - 3409-

- Removal tool - VAS 40338-
- Vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052-

Removing

– Screw piston out of brake caliper as far as possible.

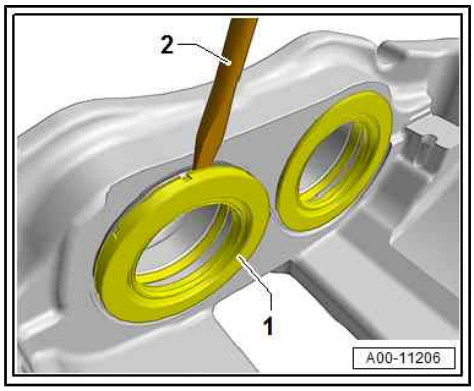
– Force piston out of brake caliper housing using compressed air.



Note

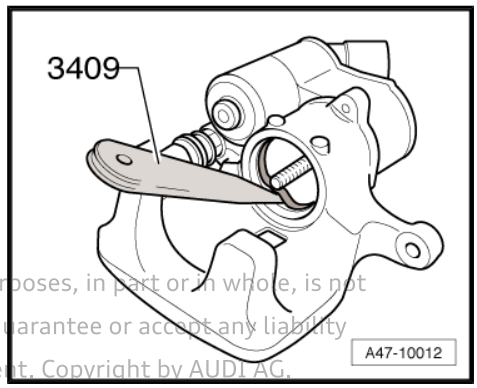
- *When removing ensure that the bore of the cylinder is not damaged.*
- *Place a piece of wood in the recess to prevent damaging the piston.*

– Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



Installing

– Fit the new seal in the brake caliper.



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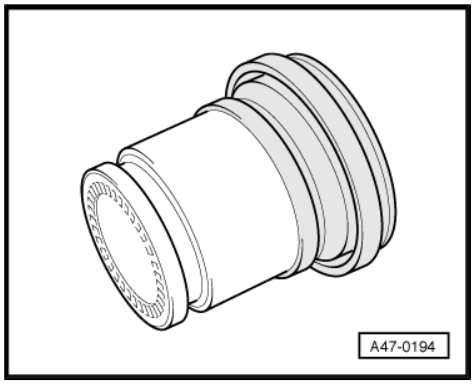
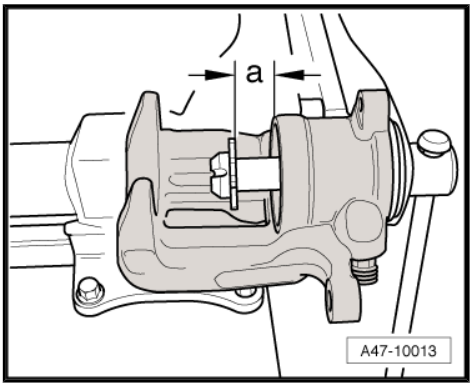
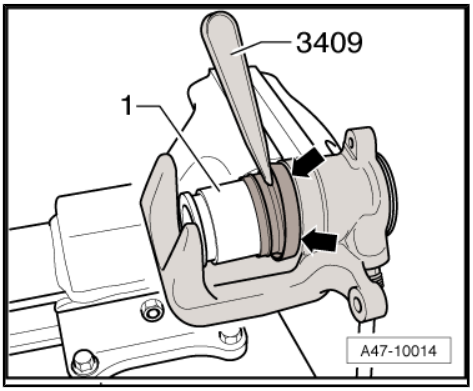
– Fit the new protective cap onto the brake piston as shown in the illustration.



– Screw in compressor nut to dimension -a- 15 mm.



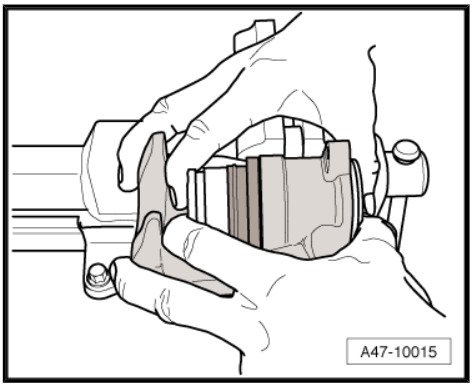
– Insert protective cap into groove in brake caliper. To do this use removal wedge - 3409- .
– Carefully slide brake piston into brake caliper. Turn brake piston as required. There are only four positions in which it is possible to guide the brake piston over the compressor nut.



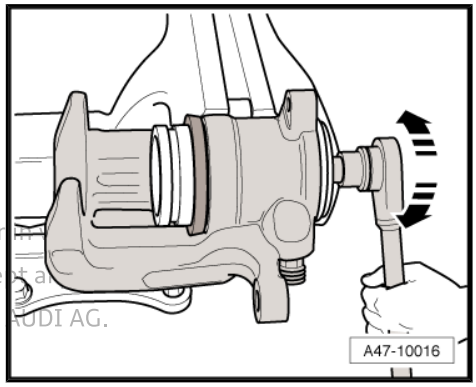
– Press brake piston onto stop in brake caliper after guiding it onto the compressor nut.

Note

Make sure not to damage the compressor nut.



– Screw in compressor nut onto stop by turning clockwise.



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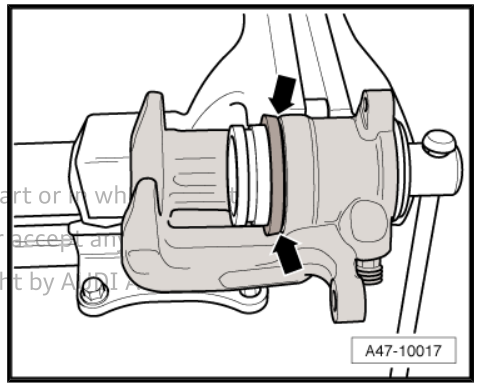
– Make sure that the protective cap fits tight all round the brake caliper housing -arrows-.



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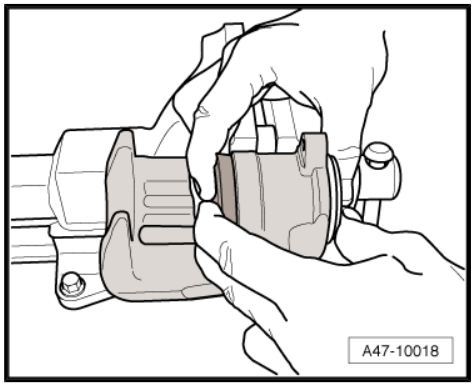
– Press piston into brake caliper by hand.



Note

The inner sealing lip on the protective cap will then locate in the piston groove.

2.3 Renewing bearing bushes and guide pins

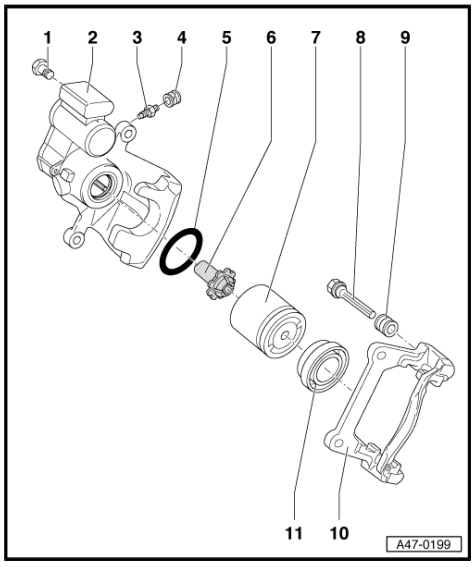
If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate guide pins.

Removing

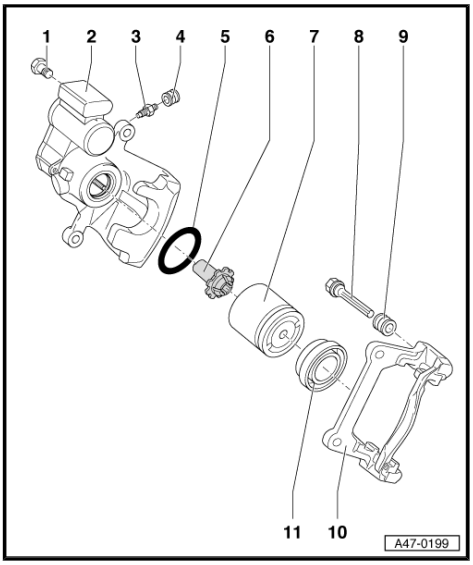
– Remove bolts -1- on brake caliper.

– Detach brake caliper.

Do not leave brake caliper hanging from brake hose but secure it to bodywork using a suitable cable tie or wire. Take care that brake hose is not damaged by weight of brake components.

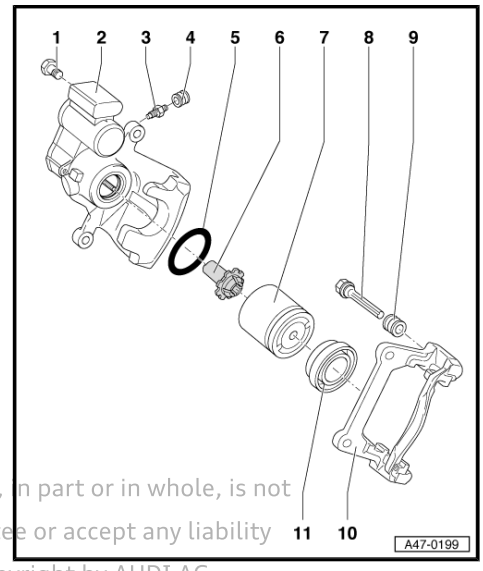


– Pull protective cap -9- out of groove in brake carrier.
– Pull guide pin -8- out of brake carrier.
– Pull protective cap off guide pin.



Installing

– Grease guide pin before installing.
– Slide protective cap over groove on guide pin.
– Push guide pin -8- with protective cap -9- through brake carrier.
– Press protective cap over groove on brake carrier.
– Install brake caliper.



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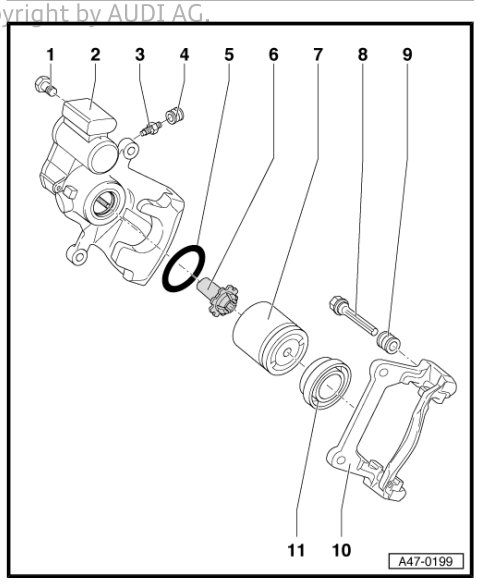
– Screw in and tighten bolts -1-.



3 Brake servo / brake master cylinder

⇒ “3.1 Exploded view - brake servo / brake master cylinder”, page 208

⇒ “3.2 Removing and installing brake servo”, page 210

⇒ “3.3 Removing and installing brake master cylinder”, page 214

⇒ “3.4 Removing and installing brake fluid reservoir”, page 217

⇒ “3.5 Removing and installing cover for brake fluid reservoir”, page 219

3.1 Exploded view - brake servo / brake master cylinder

Note

- *Brake master cylinders can no longer be dismantled, i.e. there is no provision for servicing.*
- *Use only new brake fluid. Observe information on brake fluid reservoir!*

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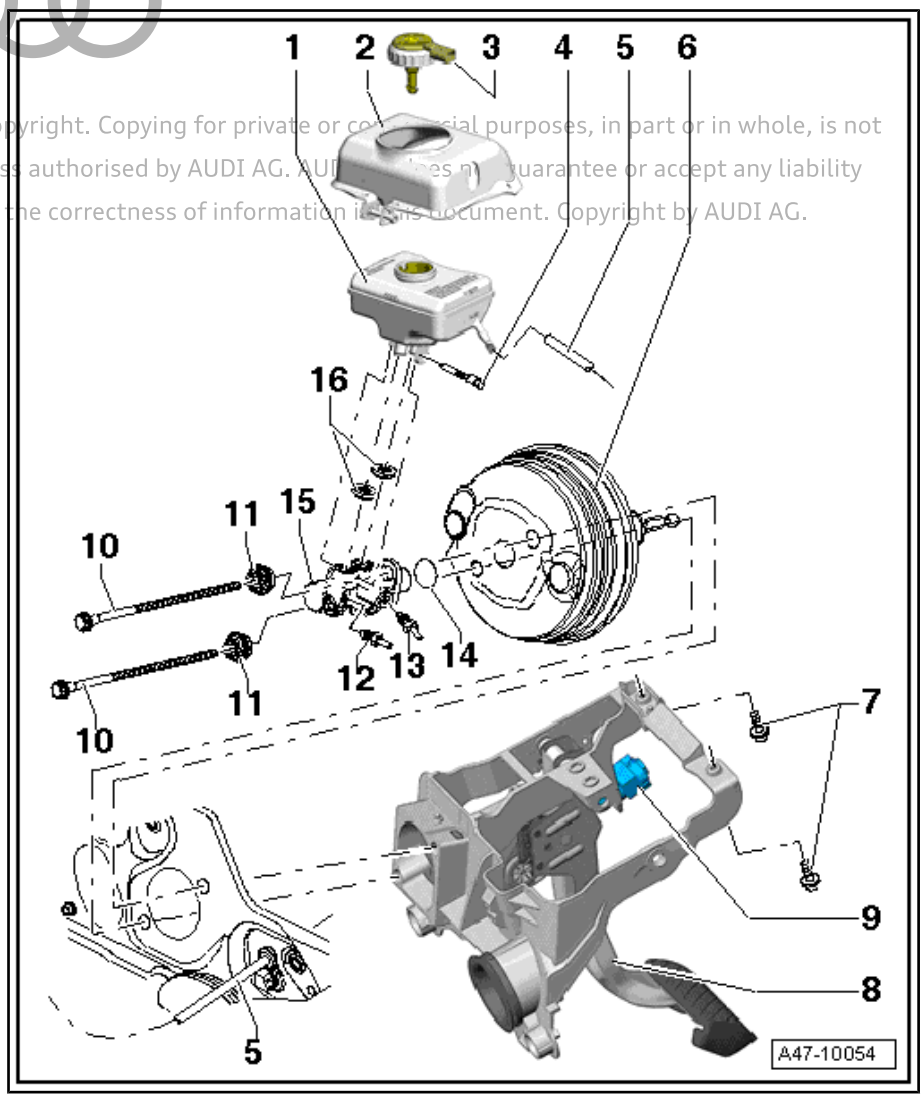

1 - Brake fluid reservoir

- ❑ Do not remove strainer from brake fluid reservoir
- ❑ Removing and installing ⇒ page 217

2 - Cover for brake fluid reservoir

- ❑ Not installed in all vehicles
- ❑ Removing and installing ⇒ page 219

3 - Filler cap with seal and warning contact for brake fluid level - -F34--

4 - Bolt

- ❑ 5 Nm

5 - Pipe to clutch master cylinder

6 - Brake servo

- ❑ Adjusting ball head ⇒ page 210
- ❑ Function test: With the engine turned off, firmly depress the brake pedal several times (this reduces the vacuum present in the servo unit).
- ❑ Then hold brake pedal in applied position employing moderate force and start engine. If the servo unit is working

properly, the pedal will
give slightly under foot (servo assistance becomes activated).

- ❑ With bonded gasket
- ❑ Renew complete unit if defective.
- ❑ Removing and installing ⇒ page 210

7 - Bolt for pedal bracket

- ❑ 20 Nm

8 - Brake pedal

- ❑ Removing and installing (vehicles with manual gearbox) ⇒ page 173
- ❑ Removing and installing (vehicles with automatic gearbox) ⇒ page 175

9 - Brake light sensor

- ❑ Removing and installing ⇒ page 40

10 - Bolt

- ❑ Connects brake servo to mounting bracket
- ❑ 25 Nm

11 - Hexagon nut

- ❑ For brake master cylinder
- ❑ 49 Nm

12 - Brake line

- ❑ Brake master cylinder to hydraulic unit
- ❑ 14 Nm

13 - Brake line

- ❑ Brake master cylinder to hydraulic unit
- ❑ 14 Nm

14 - Seal

- ❑ Renew

15 - Brake master cylinder

- ❑ Cannot be repaired. Renew complete unit if defective
- ❑ Removing and installing ⇒ page 214

16 - Sealing plug

- ❑ Moisten with brake fluid and press into brake fluid reservoir

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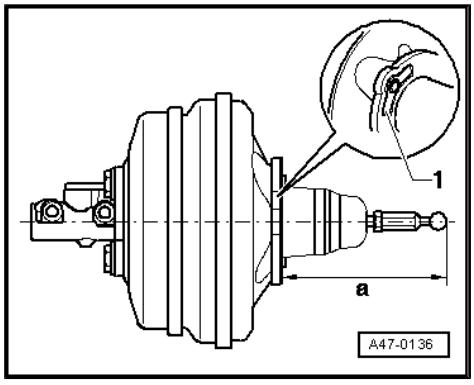
Note

Use only new brake fluid. Observe information on brake fluid reservoir!



Adjusting ball head

Left-hand drive vehicles:

-a = 164.7 mm ± 0.5 mm-

Note

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- *Surface -1- for measuring.*
- *The ball head must be set at right angles to the surface of the brake servo when taking the measurement.*
- *Measure to end of ball head without gasket fitted.*

Ball head to push rod 30 Nm

3.2 Removing and installing brake servo

Removing

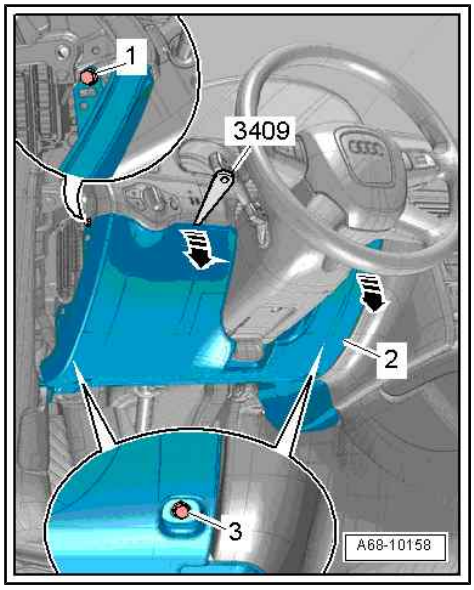
Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Adapter - VAS 5234/1-
- Brake filling and bleeding equipment - VAS 5234-
- Sealing plug repair kit - 1H0 698 311 A-

– Switch off engine.

– Press brake pedal repeatedly (“pump” the vacuum out of the brake servo) until there is no more servo assistance and the brake pedal is heavy.

– Remove driver's storage compartment -1 ... 3-.



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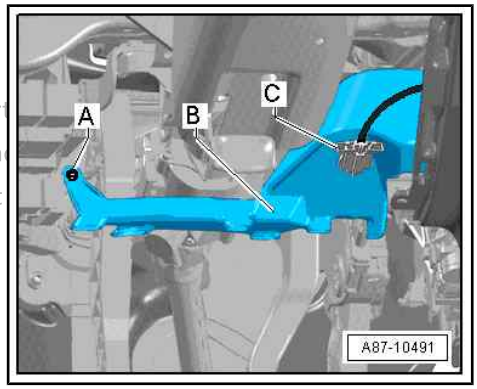
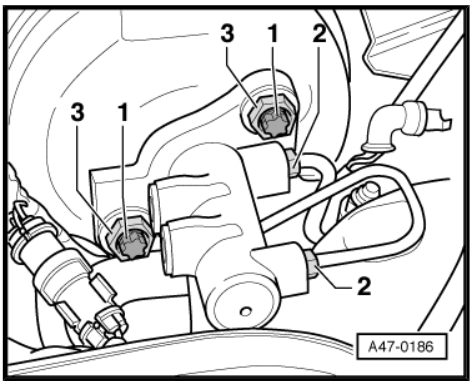
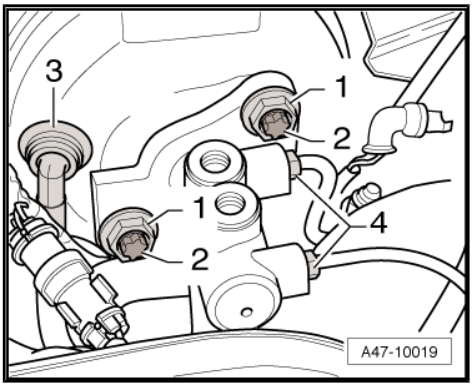
– Unplug electrical connector -C- on footwell vent.
– Remove footwell vent -A-B-.
– Remove brake light sensor ⇒ page 40 .
– Separate brake pedal from brake servo ⇒ page 169 .
– Detach engine cover panel.
– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
– Remove body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
– Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .
– Remove brake fluid reservoir ⇒ page 217 .



– Unscrew nuts -3- for brake master cylinder ⇒ page 214 .
– Remove brake master cylinder from vehicle.
– Put down brake master cylinder so that no brake fluid can escape.



– Detach vacuum line -3- from brake servo.

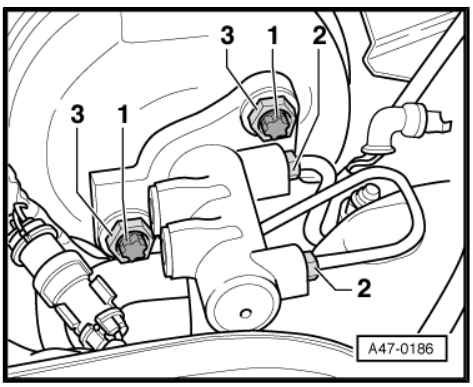


– Remove bolts -1- securing brake servo to mounting bracket.
– Remove brake servo from vehicle.

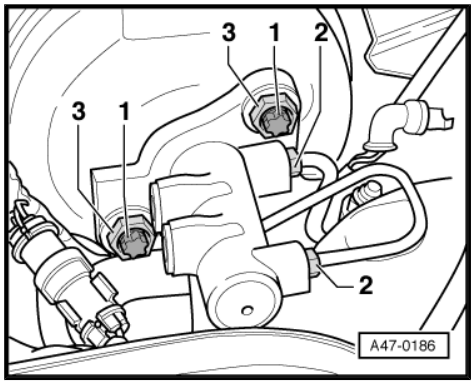
Installing

– Fit brake servo in vehicle.

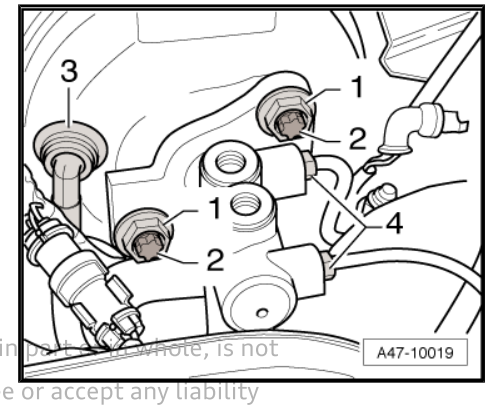
Make sure that gasket is seated correctly.



– Install and tighten bolts -1- securing brake servo to mounting bracket.



– Push vacuum line -3- into brake servo.
– Install brake master cylinder ⇒ page 214 .
– Install brake fluid reservoir ⇒ page 217 .
– On vehicles with manual gearbox, attach hydraulic line -5- for clutch to brake fluid reservoir.



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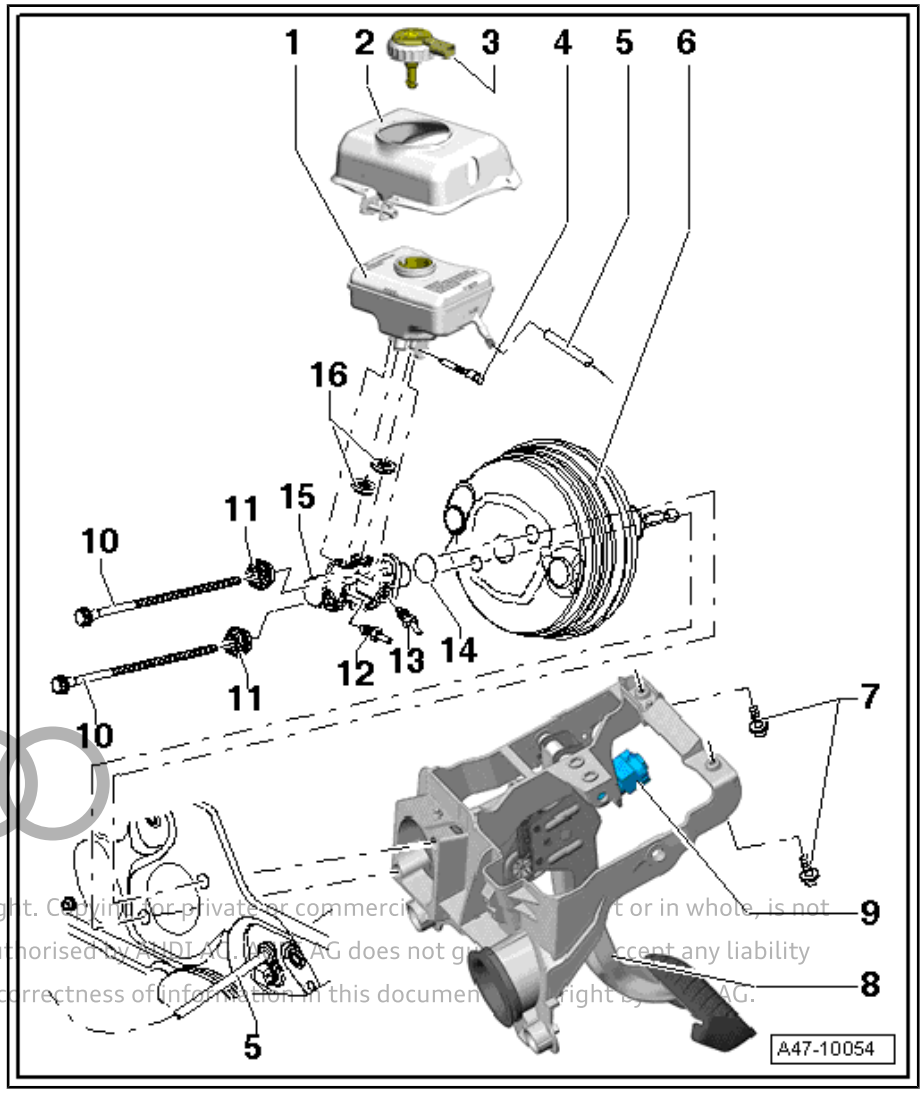

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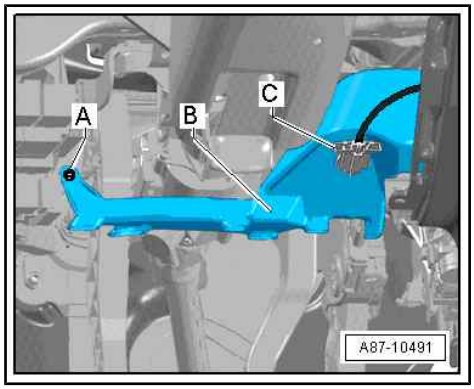
– Fill up brake fluid as far as mark.
– Bleed brake system ⇒ page 248 .
– On vehicles with manual gearbox, bleed clutch system ⇒ Rep. gr. 30 ; Clutch mechanism; Bleeding clutch hydraulics .
– Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .
– Install body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
– Install engine cover panel.
– Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

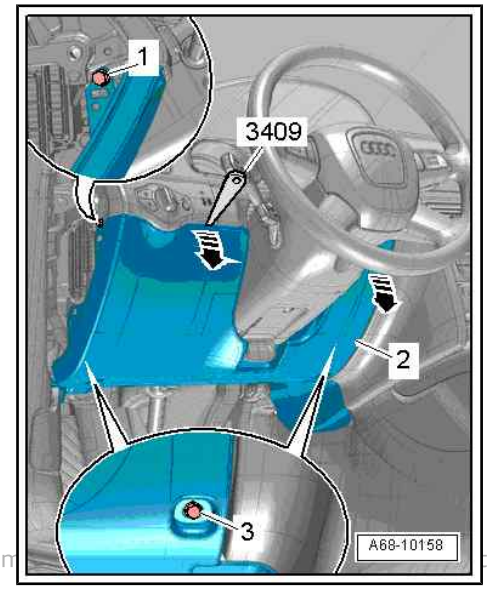
Attaching brake pedal to brake servo

– Hold ball head of push rod in front of mounting and push brake pedal towards brake servo so that ball head audibly locks into place.
– Install brake light sensor ⇒ page 40 .

– Install footwell vent -A-.
– Plug in electrical connector -C- on footwell vent.



– Install driver's storage compartment -1 ... 3-.



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3.3 Removing and installing brake master cylinder

Removing

Special tools and workshop equipment required

- Torque wrench - V.A.G 1331-
- Adapter - VAS 5234/1-
- Brake filling and bleeding equipment - VAS 5234-
- Sealing plug repair kit - 1H0 698 311 A-

Removing

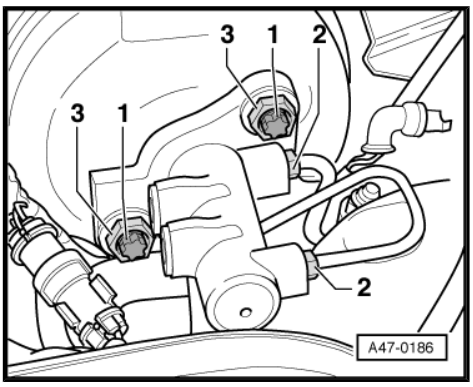
– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
– Detach engine cover panel.
– Remove body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
– Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - bulkhead .
– As protection against escaping brake fluid, place a sufficient number of lint-free cloths in area beneath brake master cylinder.

– Extract as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 5234- .

WARNING

- *Brake fluid must NOT come into contact with fluids containing mineral oils (oil, petrol, cleaning agents). Mineral oils damage the plugs and sleeves in the brake system.*
- *Brake fluid is poisonous and must NOT be drawn off by sucking through a hose. Additionally, because of its corrosive effect, it must not be allowed to come into contact with paintwork.*
- *Always observe the relevant environmental regulations for disposal.*

– Remove brake fluid reservoir ⇒ page 217 .
– Disconnect brake lines -2- from brake master cylinder and seal brake lines with plugs from repair kit.
– Unscrew securing nuts -3- for brake master cylinder.
– Detach brake master cylinder from brake servo.
– Remove brake master cylinder from vehicle.



Caution

Brake fluid must not be allowed to enter the brake servo.

Installing

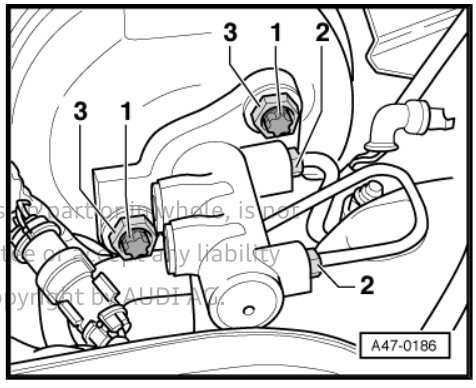
Installation is carried out in reverse sequence.

Caution

Brake fluid must not be allowed to enter the brake servo.

Use new nuts.

– Renew seal between brake master cylinder and brake servo.
– When fitting brake master cylinder, make sure that push rod is correctly positioned in brake servo.
– Depress brake pedal slightly to make it easier to guide push rod into brake master cylinder.



– Install and tighten new nuts -3-. Observe tightening torque.
– Connect brake lines -2- to brake master cylinder. Observe tightening torque.
– Install brake fluid reservoir ⇒ page 217 .
– On vehicles with manual gearbox, attach hydraulic line -5- for clutch to brake fluid reservoir.

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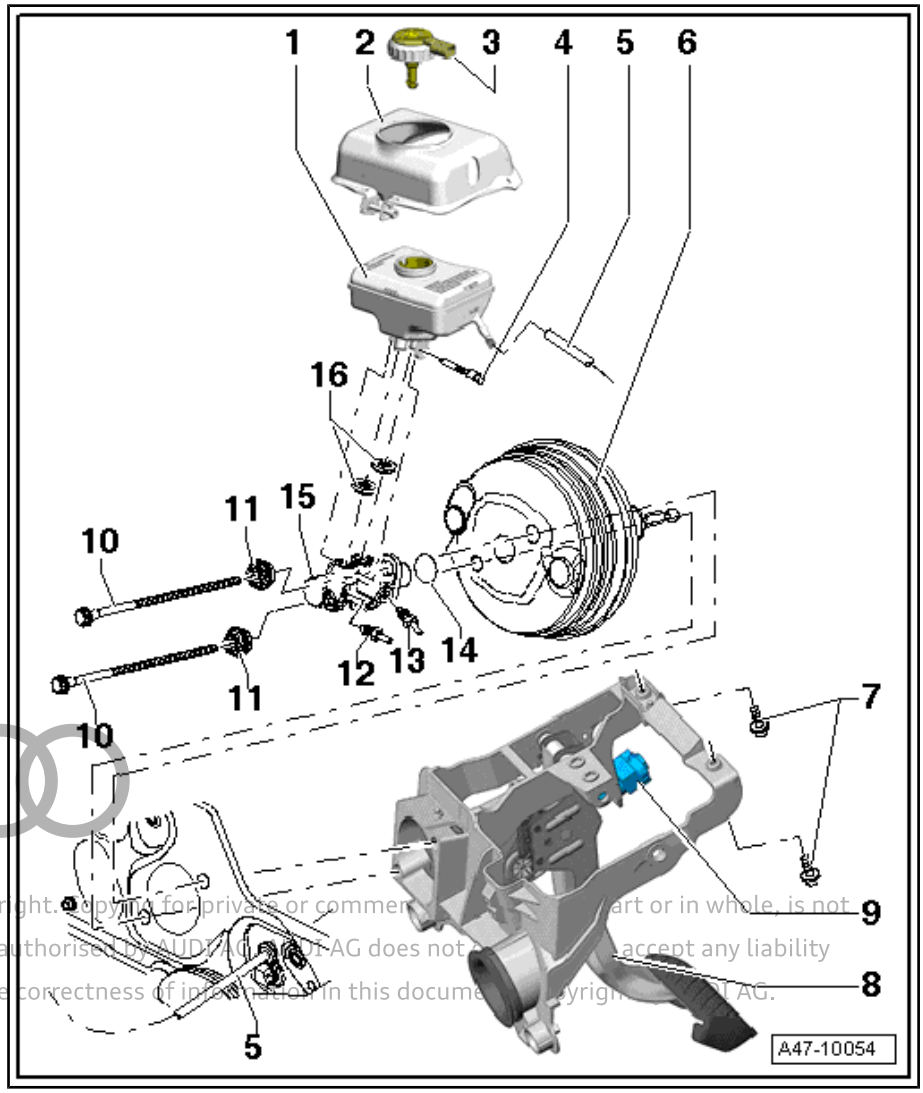

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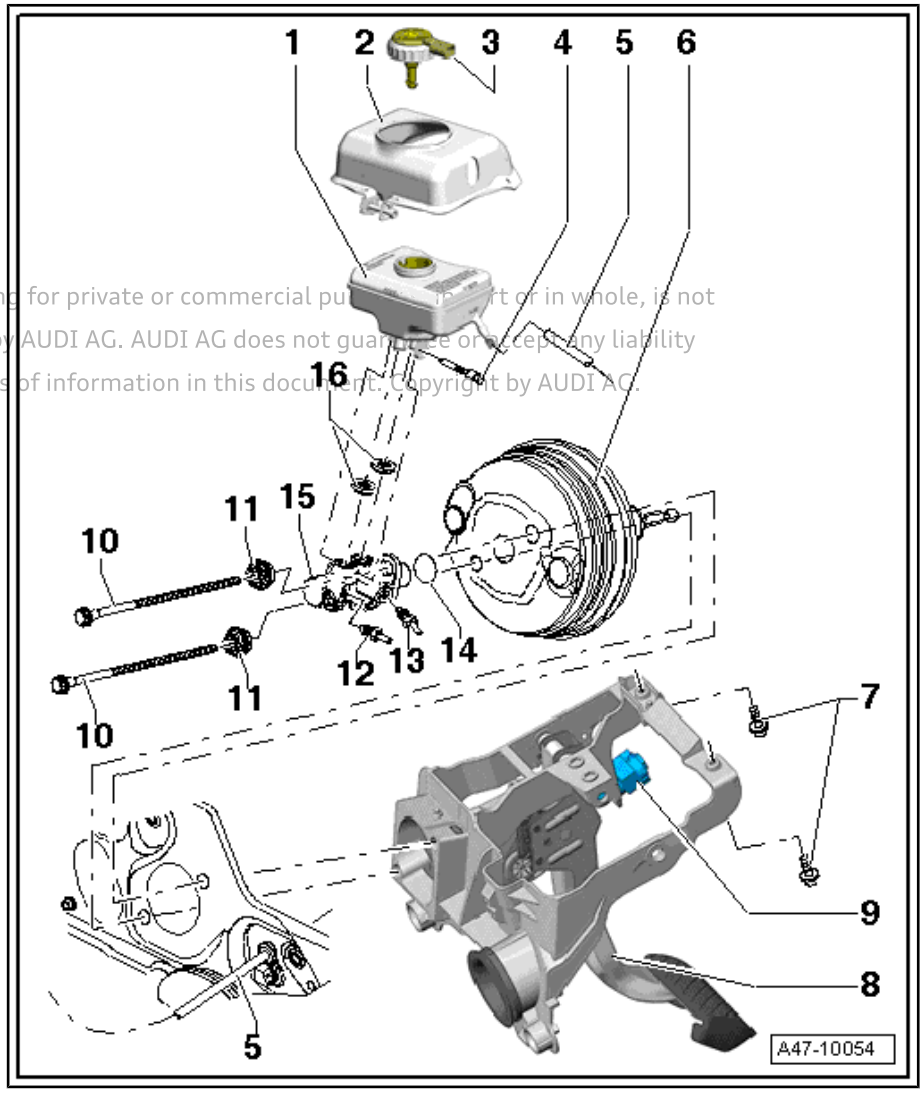
- Fill up brake fluid as far as mark.
- Bleed brake system ⇒ page 248 .
- On vehicles with manual gearbox, bleed clutch system ⇒ Rep. gr. 30 ; Clutch mechanism; Bleeding clutch hydraulics .
- Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Install body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Install engine cover panel.
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Carry out ESP road test and system test.

3.4 Removing and installing brake fluid reservoir

Removing

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Unplug electrical connector for brake fluid level warning contact - -F34-- .
- Remove cover for brake fluid reservoir ⇒ page 219 .
- As protection against escaping brake fluid, place a sufficient number of lint-free cloths in area beneath brake master cylinder.
- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 5234- and adapter - VAS 5234/1- .
- On vehicles with manual gearbox, detach hydraulic line for clutch -5- from brake fluid reservoir and seal off.



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WARNING

- *Brake fluid must NOT come into contact with fluids containing mineral oils (oil, petrol, cleaning agents). Mineral oils damage the plugs and sleeves in the brake system.*
- *Brake fluid is poisonous and must NOT be drawn off by sucking through a hose. Additionally, because of its corrosive effect, it must not be allowed to come into contact with paintwork.*
- *Always observe the relevant environmental regulations for disposal.*

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– Pull locking pin at bottom out of brake fluid reservoir.

– Remove brake fluid reservoir from brake master cylinder.

Installing

Do not remove dust cap from new brake fluid reservoir until reservoir is ready to be filled.

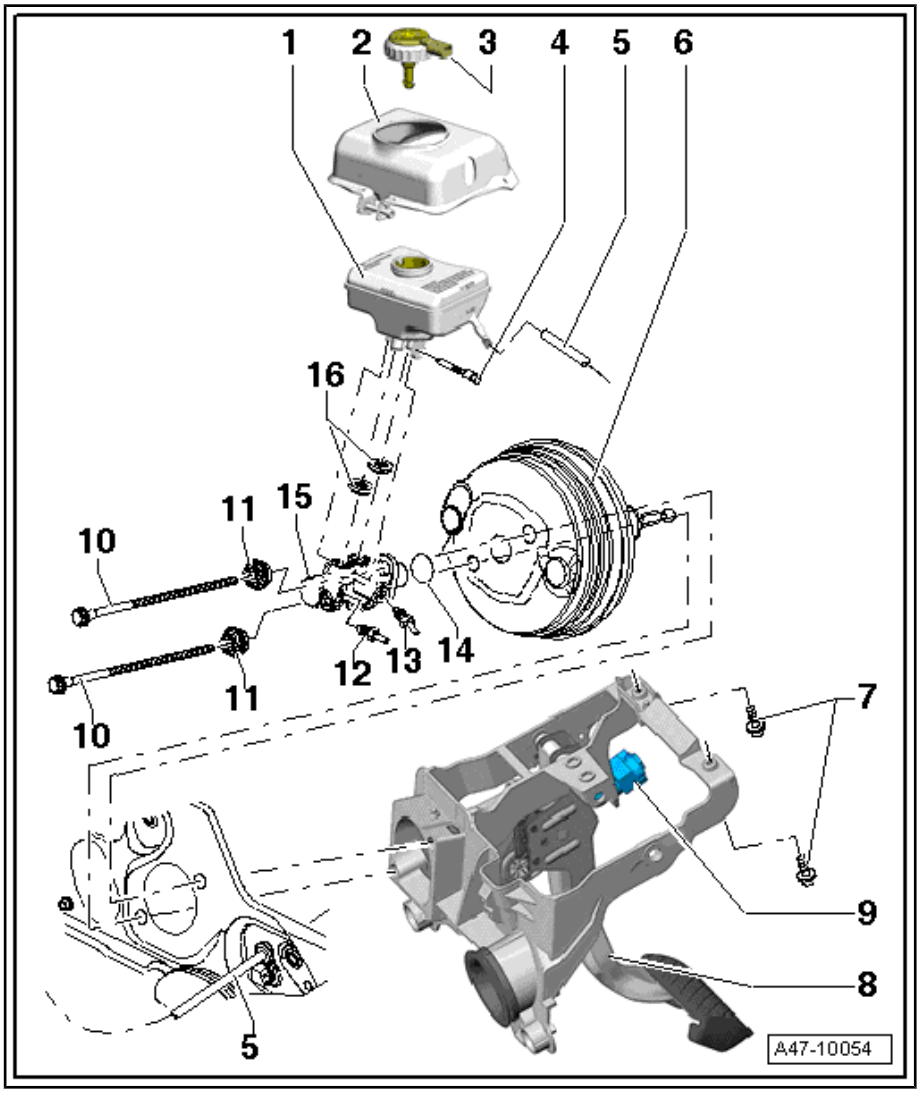
– Lubricate plugs on brake fluid reservoir with brake fluid.

– Insert brake fluid reservoir in sealing plugs in brake master cylinder.

– Press locking pin at bottom through brake fluid reservoir.

– Plug in electrical connector for brake fluid level warning contact - -F34-- .

– On vehicles with manual gearbox, attach hydraulic line for clutch -5- to brake fluid reservoir.



– Fill up brake fluid as far as mark.
– Bleed brake system ⇒ page 248 .
– On vehicles with manual gearbox, bleed clutch system ⇒ Rep. gr. 30 ; Clutch mechanism; Bleeding clutch hydraulics .
– Install cover for brake fluid reservoir.

Note

The cover for the brake fluid reservoir is not fitted on all vehicles.

– Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

3.5 Removing and installing cover for brake fluid reservoir

Not installed in all vehicles

The cover for the brake fluid reservoir has an aperture on the left side for checking the brake fluid level. To avoid later damage, make sure no brake fluid is allowed to penetrate between the brake fluid reservoir and the cover for the brake fluid reservoir.

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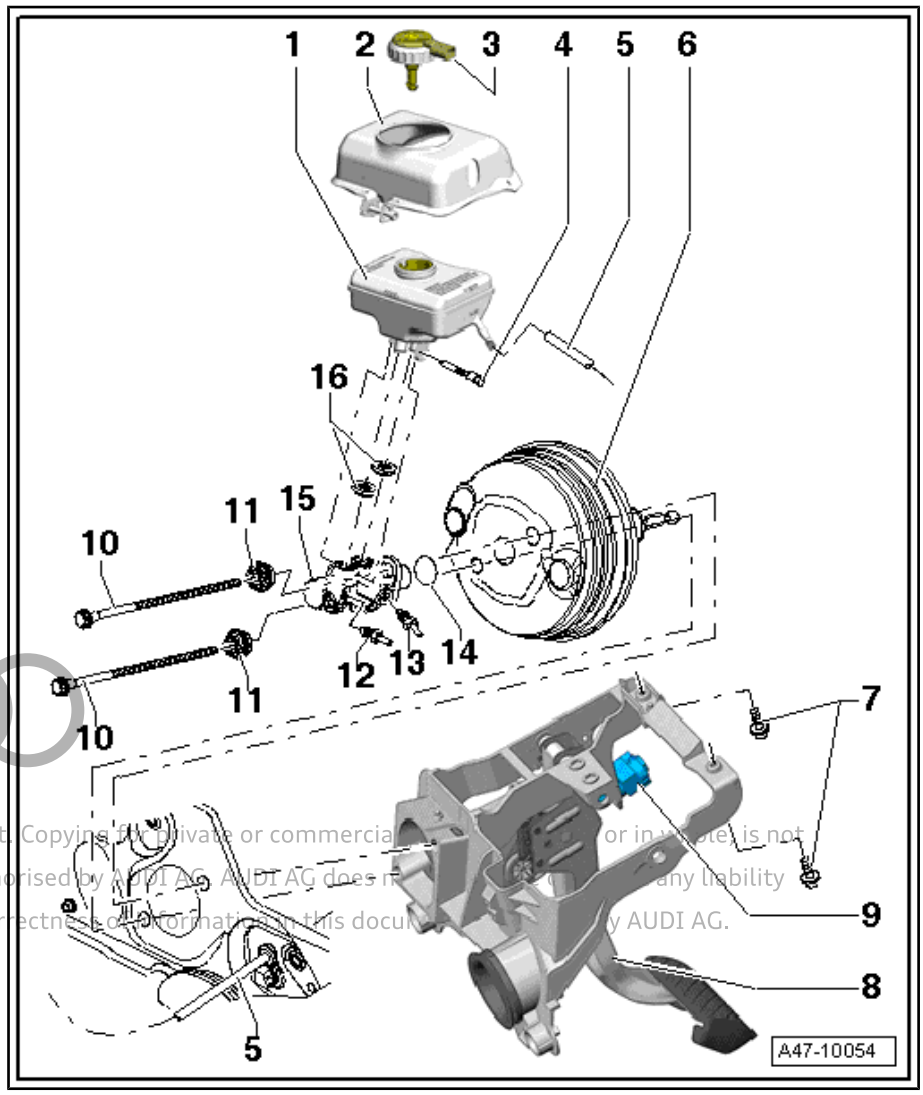
Removing

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

– Remove bolt -4-.



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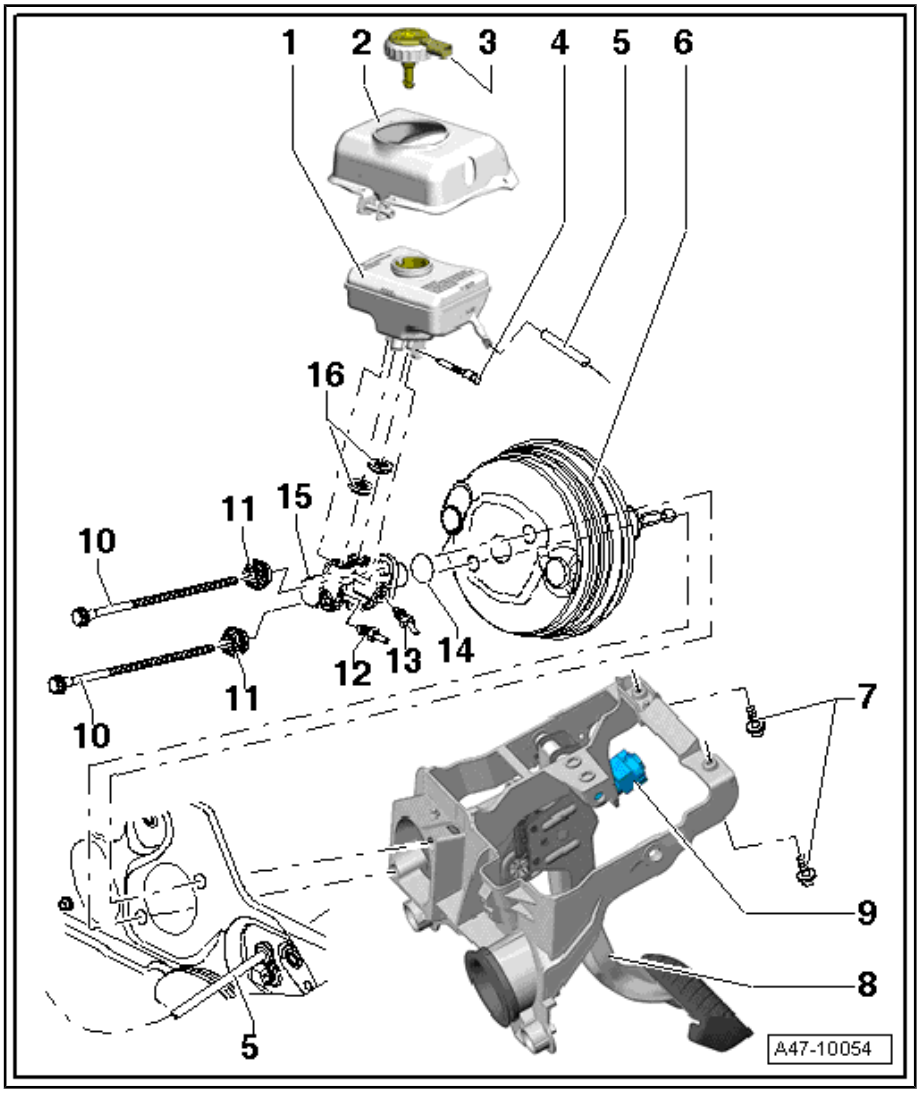
– Remove cover for brake fluid reservoir from vehicle.

Installing

– Fit cover for brake fluid reservoir over brake fluid reservoir.

– Screw in and tighten bolt -4-.



– Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

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4 Vacuum system

⇒ “4.1 Exploded view - electric vacuum pump”, page 222

⇒ “4.2 Exploded view - vacuum pump”, page 225

⇒ “4.3 Checking non-return valve”, page 226

⇒ “4.4 Removing and installing non-return valve”, page 226

⇒ “4.5 Removing and installing brake servo pressure sensor”, page 228

⇒ “4.6 Checking vacuum system”, page 229

⇒ “4.7 Removing and installing electric vacuum pump for brakes”, page 231

⇒ “4.8 Removing and installing bracket for electric vacuum pump”, page 236

⇒ “4.9 Removing and installing vacuum pump”, page 237

4.1 Exploded view - electric vacuum pump

⇒ “4.1.1 Exploded view - electric vacuum pump, all vehicles except RS 5”, page 222

⇒ “4.1.2 Exploded view - electric vacuum pump, RS 5”, page 223

4.1.1 Exploded view - electric vacuum pump, all vehicles except RS 5

The vacuum pump -V192- is not installed on all engine versions.

The electric vacuum pump -V192- is switched on by the engine control unit according to intake manifold pressure.

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1 - Vacuum line

2 - Electrical connector

3 - Vacuum pump for brakes - V192-

- ❑ Removing and installing ⇒ page 231
- ❑ Checking ⇒ page 229

4 - Non-return valve

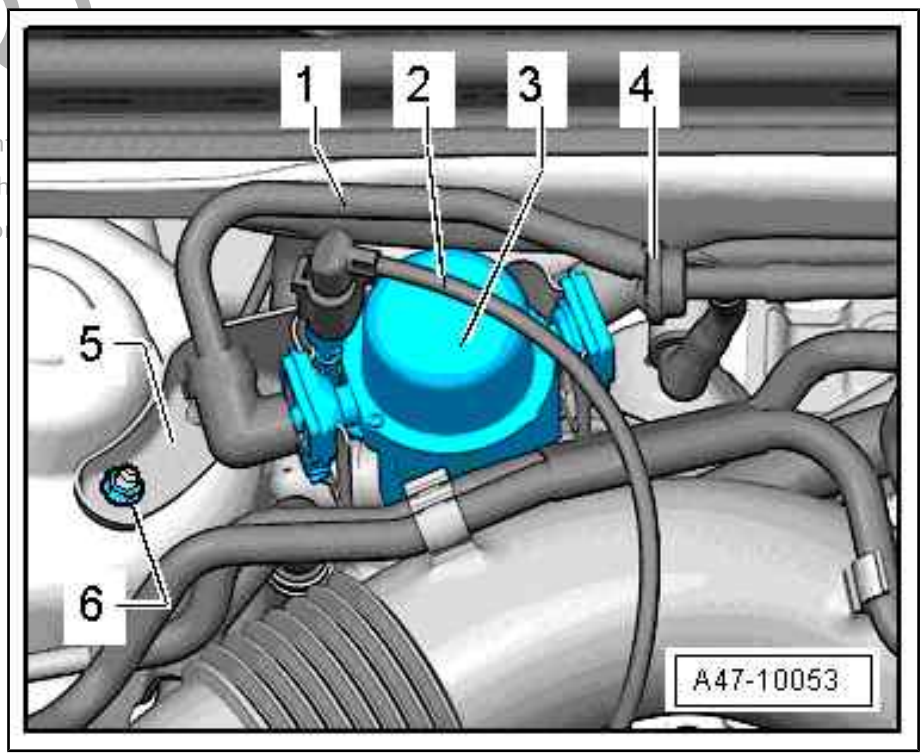
- ❑ Removing and installing
- ❑ Checking ⇒ page 226

5 - Bracket for vacuum pump - V 192-

- ❑ Removing and installing ⇒ page 236

6 - Nut for bracket

- ❑ 20 Nm



4.1.2 Exploded view - electric vacuum pump, RS 5

The electric vacuum pump -V192- is switched on by the engine control unit according to intake manifold pressure.

Note

The front wheel housing liner (left-side) must first be removed in order to remove the vacuum pump ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

The diagram shows the vacuum pump for brakes - V192- from below after removing the front wheel housing liner (left-side).

1 - Bracket

- To remove, first remove vacuum pump for brakes - V192-
- Removing and installing ⇒ page 237

2 - Bolt for bracket

- 20 Nm

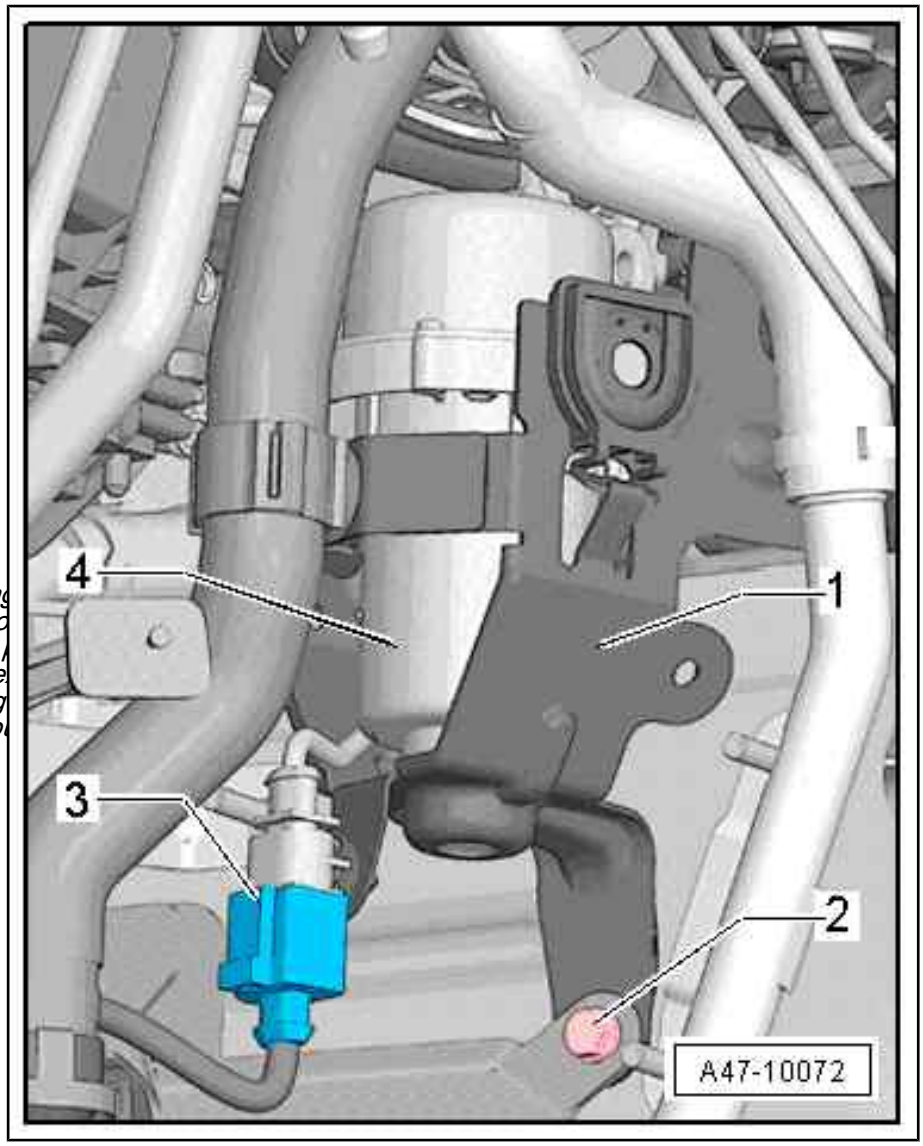
3 - Electrical connector

4 - Vacuum pump for brakes - V192-

- Removing and installing ⇒ page 233
- Checking ⇒ page 230

Note

The front wheel housing side) must first be remo to remove the vacuum General body repairs, e gr. 66 ; Wheel housing ploded view - wheel ho (front) .



The diagram shows the vacuum pump for brakes - V192- in the engine compartment (front left).

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1 - Bolt for bracket

- ❑ 20 Nm

2 - Vacuum pump for brakes - V192-

- ❑ Removing and installing ⇒ page 233
- ❑ Checking ⇒ page 230

Note

The front wheel housing side) must first be remo to remove the vacuum p General body repairs, e gr. 66 ; Wheel housing ploded view - wheel ho (front) .

3 - Non-return valve

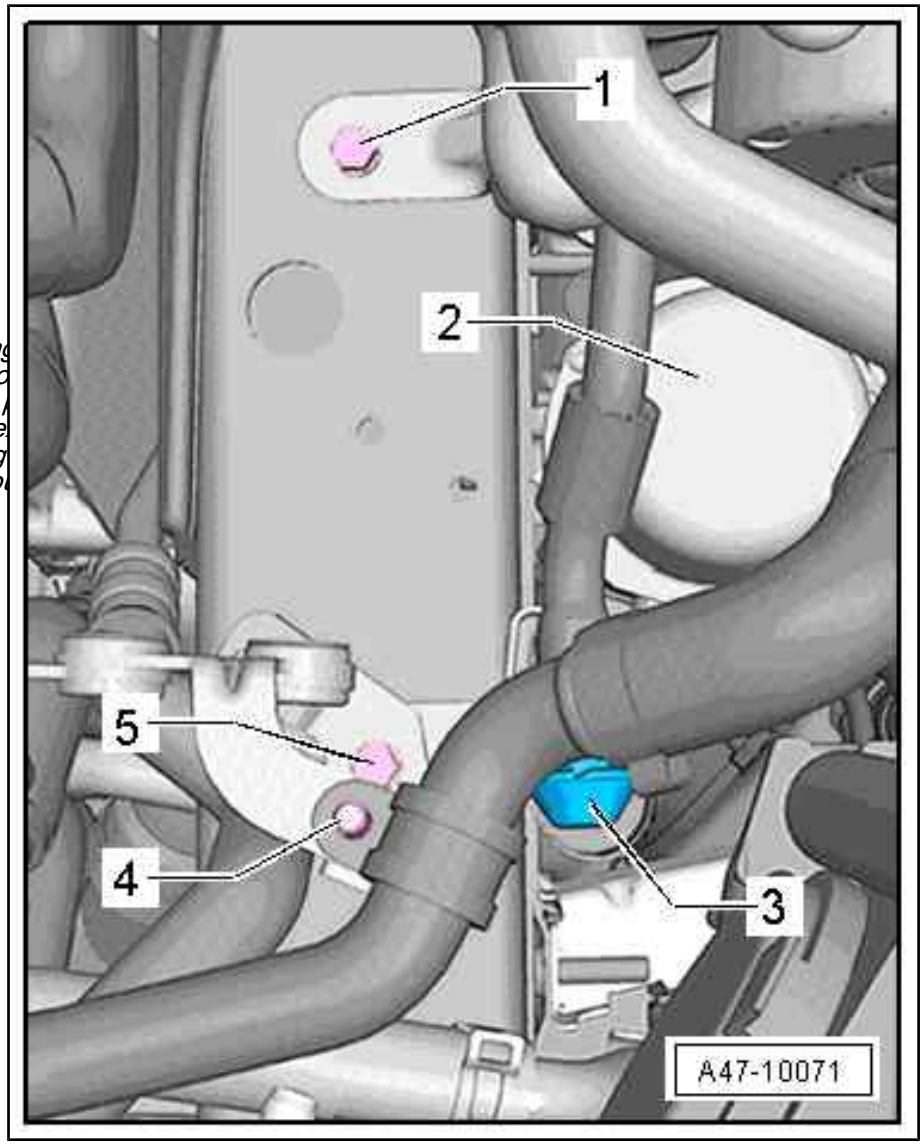
- ❑ Removing and installing ⇒ page 227
- ❑ Checking ⇒ page 226

4 - Nut

- ❑ Bracket for secondary air pump hose
- ❑ 20 Nm

5 - Bolt for bracket

- ❑ 20 Nm



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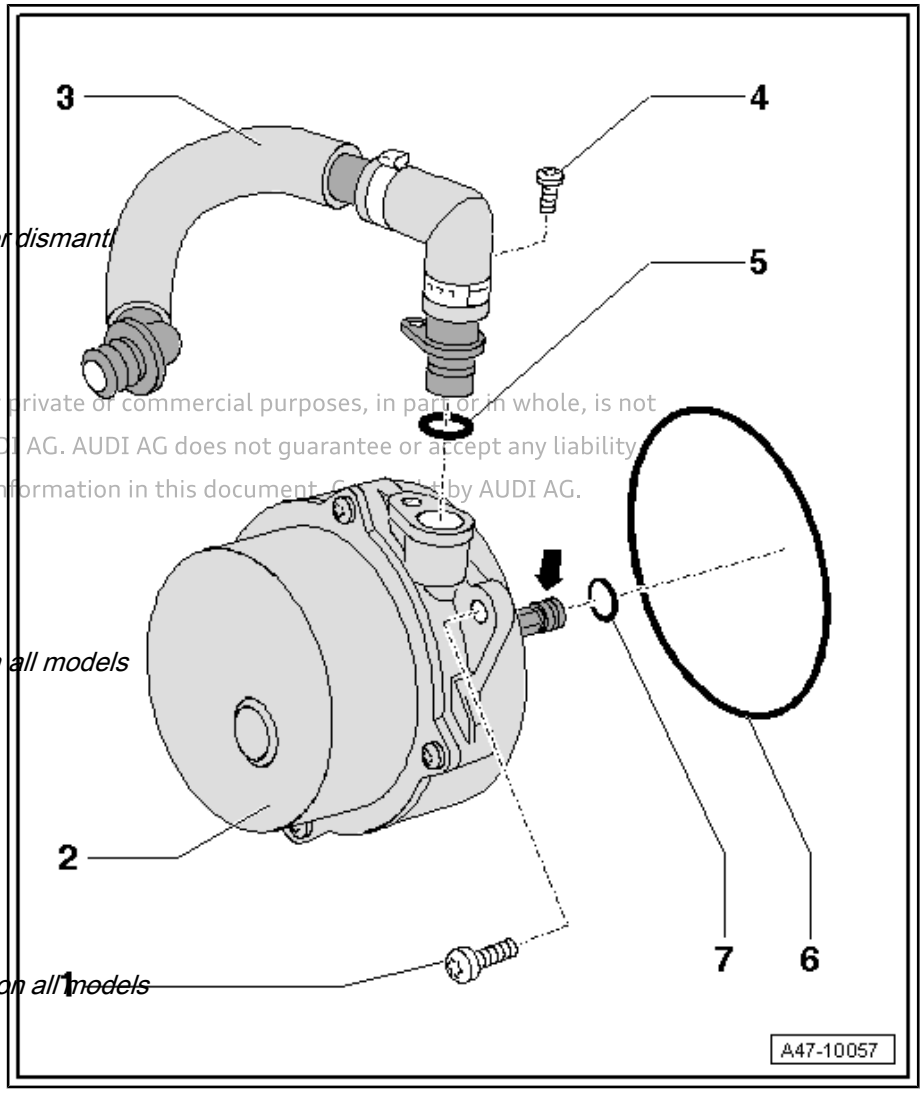
4.2 Exploded view - vacuum pump

Note

Illustration shows only vacuum pump, not fitting location



1 - Bolt

- ❑ 9 Nm
- ❑ Unscrew in order to remove pump

Note

There is no provision for dismantl the pump any further.

2 - Vacuum pump

3 - Vacuum hose

- ❑ Secure with hose clips (same as original equipment) ⇒ ETKA

4 - Bolt

- ❑ 5 Nm

Note

The bolt is not fitted on all models

Alternatively, secure vacuum hose with hose clip (same as original equipment) ⇒ ETKA

5 - O-ring

- ❑ Renew

Note

The O-ring is not fitted on all models

6 - O-ring

- ❑ Renew

Note

The O-ring is not fitted on all models

7 - O-ring

- ❑ Renew

Note

The O-ring is not fitted on all models

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4.3 Checking non-return valve

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⇒ “4.3.1 Checking non-return valve - all vehicles except RS 5”, page 226

⇒ “4.3.2 Checking non-return valve - RS 5 ”, page 226

4.3.1 Checking non-return valve - all vehicles except RS 5

The valve should allow air to pass in the direction indicated by the arrow.

Valve must remain closed in opposite direction.

Observe correct installation position.

The arrow points towards the vacuum pump.

4.3.2 Checking non-return valve - RS 5

The valve should allow air to pass in the direction indicated by the arrow.

Valve must remain closed in opposite direction.

Observe correct installation position.

The arrow points towards the vacuum pump.

4.4 Removing and installing non-return valve

⇒ “4.4.1 Removing and installing non-return valve - all vehicles except RS 5”, page 226

⇒ “4.4.2 Removing and installing non-return valve - RS 5 ”, page 227

4.4.1 Removing and installing non-return valve - all vehicles except RS 5

Removing

– Use suitable pliers to open clip on vacuum hose.

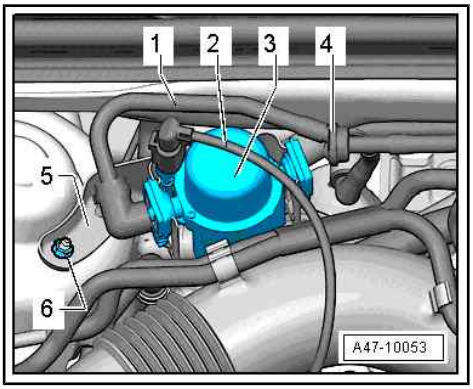
– Disconnect vacuum hose from pump.

Caution

The vacuum hose must not be twisted or kinked. The vacuum hose must be renewed if it is damaged.

– Disconnect vacuum hoses on both sides of non-return valve -4-.

– Remove non-return valve from vehicle.



Installing

Caution

Make sure that non-return valve is installed in correct position. Arrow on valve points towards pump.

The valve should allow air to pass in the direction indicated by the arrow.

The arrow points towards the vacuum pump.

– Push vacuum hoses onto both sides of non-return valve -4-.

Note

Moisten vacuum hose with water to facilitate assembly.

– Fit new hose clip onto vacuum hose.

– Push vacuum hose onto pump.

– Close hose clip using suitable pliers.

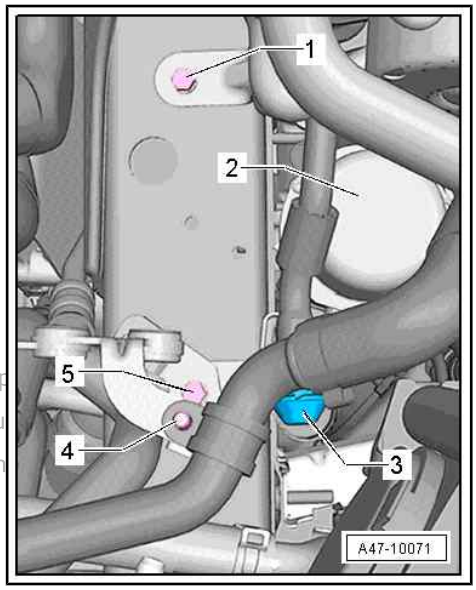
4.4.2 Removing and installing non-return valve - RS 5

Removing

– Use suitable pliers to open clip on vacuum hose.

– Disconnect vacuum hose from pump.

– Disconnect vacuum hoses on both sides of non-return valve -3-.



Caution

The vacuum hose must not be twisted or kinked. The vacuum hose must be renewed if it is damaged.

– Remove non-return valve from vehicle.

Installing

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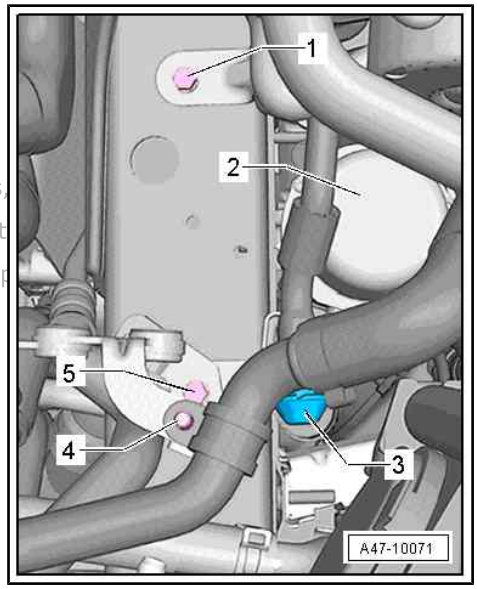
Caution

Make sure that non-return valve is installed in correct position. Arrow on valve points towards pump.

The valve should allow air to pass in the direction indicated by the arrow.

The arrow points towards the vacuum pump.

– Push vacuum hoses onto both sides of non-return valve -3-.



Note

Moisten vacuum hose with water to facilitate assembly.

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– Fit new hose clip onto vacuum hose.
– Push vacuum hose onto pump.
– Close hose clip using suitable pliers.

4.5 Removing and installing brake servo pressure sensor

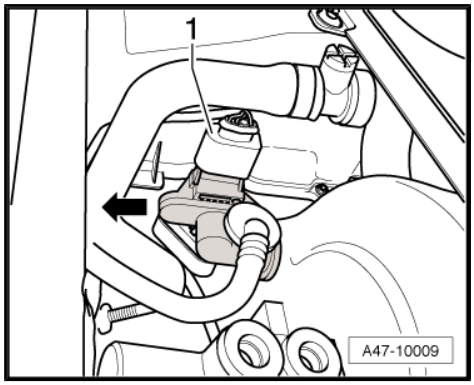
Removing

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Note

The brake servo pressure sensor - G294- is located in the plenum chamber next to the brake servo.

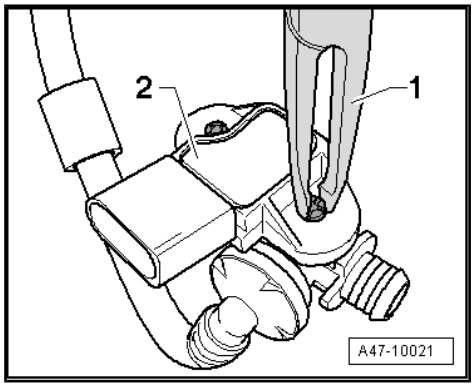
– Unplug electrical connector -1-.
– Pull out pressure sensor in direction of -arrow-.



Note

The pressure sensor is secured with clips.

– Release clip using pliers -1-.
– Carefully lever off brake servo pressure sensor - G294- .



Installing

Installation is carried out in reverse sequence.

4.6 Checking vacuum system

⇒ “4.6.1 Checking vacuum system - all vehicles except RS 5”, page 229

⇒ “4.6.2 Checking vacuum system - RS 5”, page 230

4.6.1 Checking vacuum system - all vehicles except RS 5

Description and function:

The electric vacuum pump is switched on by the engine control unit, depending on intake manifold pressure.

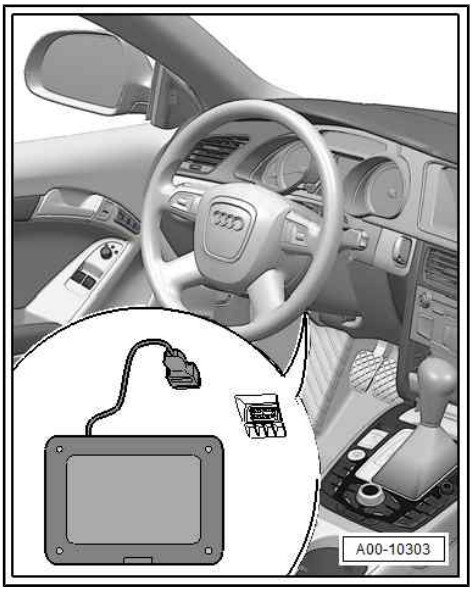
The vacuum pump is capable of self-diagnosis. Recognised faults are stored in the engine control unit.

Note

The engine must not be running when you check the function of the electric vacuum pump via self-diagnosis.

Special tools and workshop equipment required

- Vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052-



Procedure

– Switch off ignition.

– Press brake pedal repeatedly (“pump” the vacuum out of the brake servo) until there is no more servo assistance and the brake pedal is heavy.

– With ignition switched off, connect vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052- to 16-pin diagnostic connector in vehicle.

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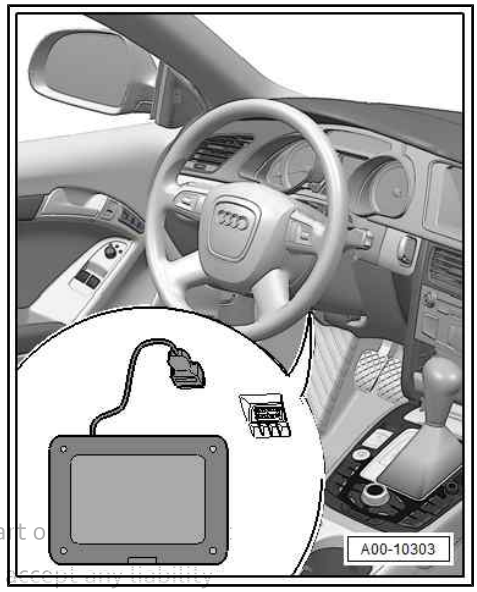
– Switch on the tester -arrow-.
– Switch on ignition.
– Start required program on vehicle diagnosis, testing and information system - VAS 5051B- -VAS 5052- .

To repeat the test, switch the ignition off and then on again.



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4.6.2 Checking vacuum system - RS 5

Description and function:

The electric vacuum pump is switched on by the engine control unit, depending on intake manifold pressure.

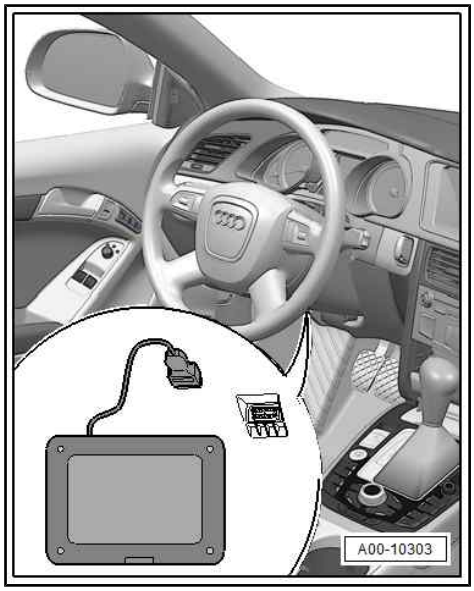
The vacuum pump is capable of self-diagnosis. Recognised faults are stored in the engine control unit.

Note

The engine must not be running when you check the function of the electric vacuum pump via self-diagnosis.

Special tools and workshop equipment required

- Vehicle diagnosis and service information system - VAS 5051B- or -VAS 5052-



Procedure

– Switch off ignition.

– Press brake pedal repeatedly (“pump” the vacuum out of the brake servo) until there is no more servo assistance and the brake pedal is heavy.
– With ignition switched off, connect vehicle diagnostic, testing and information system - VAS 5051B- or -VAS 5052- to 16-pin diagnostic connector in vehicle.
– Switch on the tester -arrow-.
– Switch on ignition.
– Start required program on vehicle diagnosis, testing and information system - VAS 5051B- -VAS 5052- .

To repeat the test, switch the ignition off and then on again.

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4.7 Removing and installing electric vacuum pump for brakes

⇒ “4.7.1 Removing and installing electric vacuum pump for brakes - all vehicles except RS 5”, page 231

⇒ “4.7.2 Removing and installing electric vacuum pump for brakes - RS 5”, page 233

4.7.1 Removing and installing electric vacuum pump for brakes - all vehicles except RS 5

The vacuum pump -V192- is not installed on all engine versions.

The electric vacuum pump (vacuum pump for brakes - V192-) is switched on by the engine control unit according to intake manifold pressure.

The vacuum pump is not intended to be serviced. If problems occur, trace the fault by means of a function test and/or pressurised leak test. If a fault is found, the electric vacuum pump must be renewed.

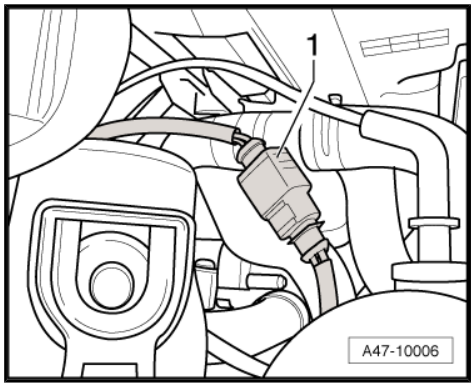
Removing

Note

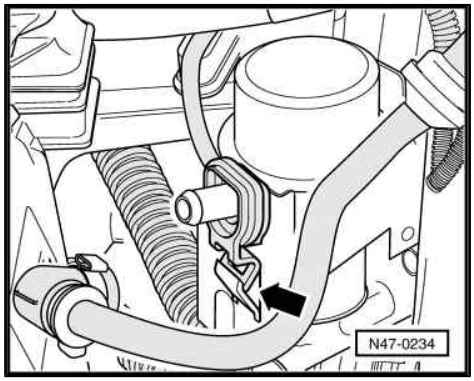
The electric vacuum pump is located on the right-side of the engine compartment in front of the plenum chamber partition panel.

– Detach engine cover panel.

– Unplug electrical connector -1-.
– Release hose clip on vacuum hose using suitable pliers.
– Disconnect vacuum hose from vacuum pump.



– Press clips -arrow- on both sides out of retainers by hand.



– Lift out electric vacuum pump, holding rubber buffer below pump firmly.

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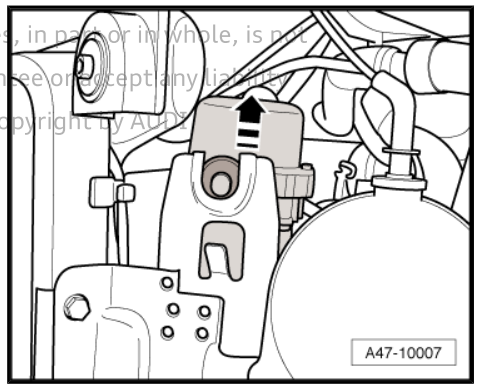


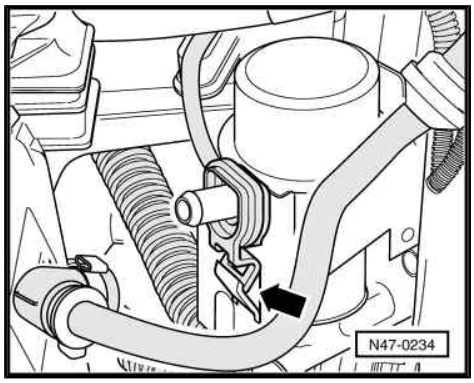
Note

Make sure that the rubber buffer below the pump does not drop into the engine compartment when detaching the vacuum pump -V192-.

Installing

Installation is carried out in reverse sequence.

– Press clips -arrow- on both sides into retainers by hand and secure vacuum pump for brakes - V192- .



Note

Use new hose clip when fitting vacuum line.

4.7.2 Removing and installing electric vacuum pump for brakes - RS 5

Note

The front wheel housing liner (left-side) must first be removed in order to remove the vacuum pump for brakes - V192- ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

The vacuum pump -V192- is not installed on all engine versions.

The electric vacuum pump (vacuum pump for brakes - V192-) is switched on by the engine control unit according to intake manifold pressure.

The vacuum pump is not intended to be serviced. If problems occur, trace the fault by means of a function test and/or pressurised leak test. If a fault is found, the electric vacuum pump must be renewed.

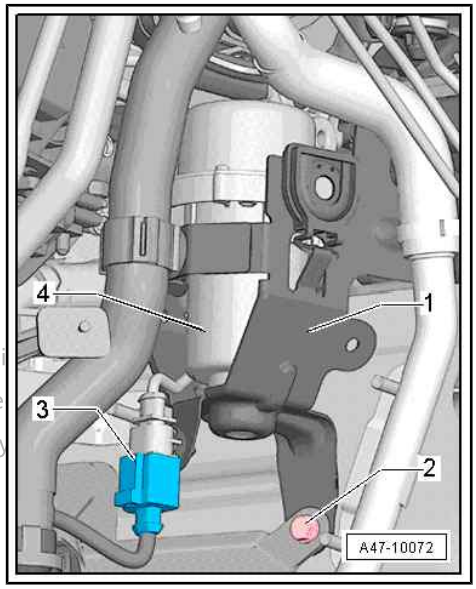
Removing

Note

The electric vacuum pump is located on the left side of the engine compartment.

– Raise vehicle.
– Remove front left wheel.
– Remove front wheel housing liner (left-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

The diagram shows the vacuum pump for brakes - V192- from below after removing the wheel housing liner.



– Unplug electrical connector -3- for vacuum pump for brakes - V192- .
– Remove bolt from bracket -2- for vacuum pump for brakes - V192- .
– Unclip secondary air pump hose from bracket for vacuum pump for brakes - V192- .
– Lower vehicle.

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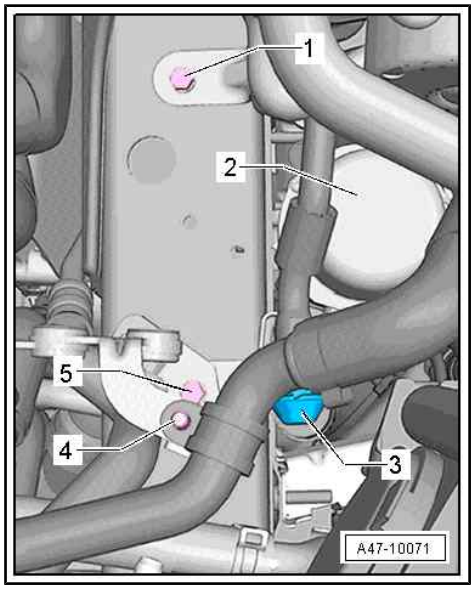
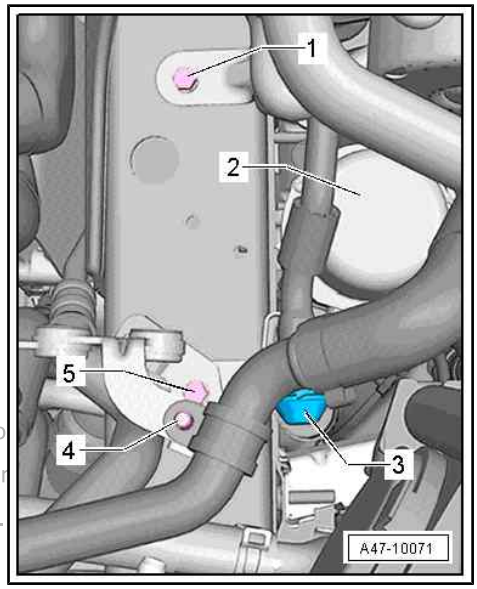
The diagram shows the vacuum pump for brakes - V192- in the engine compartment (front left).



- Unbolt secondary air pump hose from bracket -4-.
- Push secondary air pump hose to one side.
- Unscrew nut from bracket for coolant pipe.
- Push coolant pipe slightly to one side.



- Unscrew two bolts -1 and 5- from bracket for vacuum pump for brakes - V192- .
- Unclip vacuum hose leading to vacuum pump for brakes - V192- from brackets in engine compartment.

Caution

The vacuum hose must not be twisted or kinked. The vacuum hose must be renewed if it is damaged.

- Use suitable pliers to open clip on vacuum hose.
- Detach vacuum hose from vacuum pump for brakes - V192- .
- Take vacuum pump for brakes - V192- out of engine compartment together with bracket.
- Remove vacuum pump for brakes - V192- from bracket.

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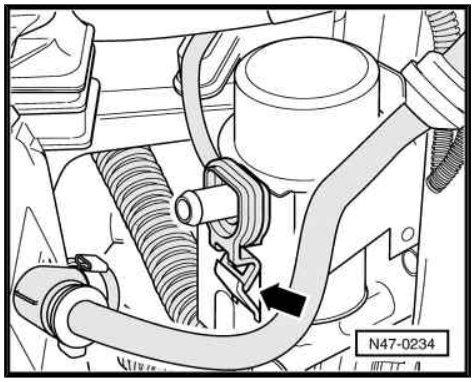
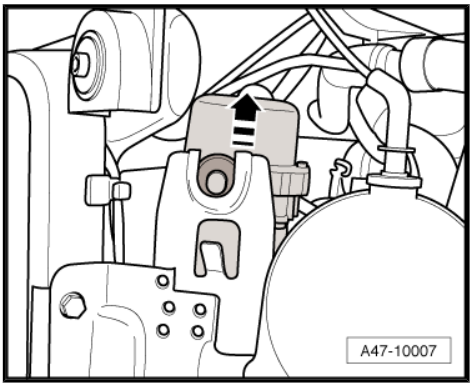


- Press clips -arrow- on both sides out of retainers by hand.

– Lift out electric vacuum pump, holding rubber buffer below pump firmly.



Installing

Installation is carried out in reverse sequence.

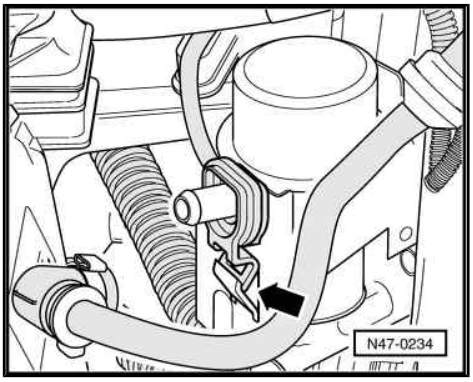
Note

Use new hose clip when fitting vacuum line.

– Fit vacuum pump for brakes - V192- in bracket.

– Press clips -arrow- on both sides into retainers by hand and secure vacuum pump for brakes - V192- .

– Install bracket with pre-fitted vacuum pump for brakes - V192- in engine compartment.



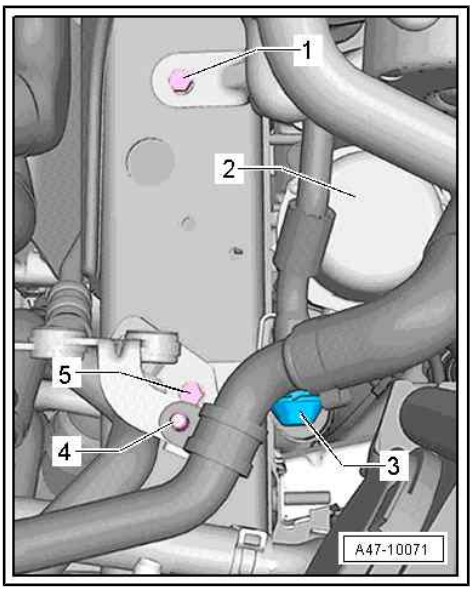
Note

Pay attention to correct installation position.

– Secure bracket for vacuum pump for brakes - V192- to body with two bolts -1 and 5-: 20 Nm.

– Fit new hose clip onto vacuum hose.

– Fit vacuum hose onto connection on vacuum pump for brakes - V192- .



Caution

The vacuum hose must not be twisted or kinked. The vacuum hose must be renewed if it is damaged.

Note

Moisten hose and connection with water to facilitate assembly.

Caution

Make sure that non-return valve is installed in correct position. Arrow on valve points towards pump.

– Close hose clip using suitable pliers.

– Fit coolant pipe with bracket onto stud.

– Secure coolant pipe with nut: 20 Nm.

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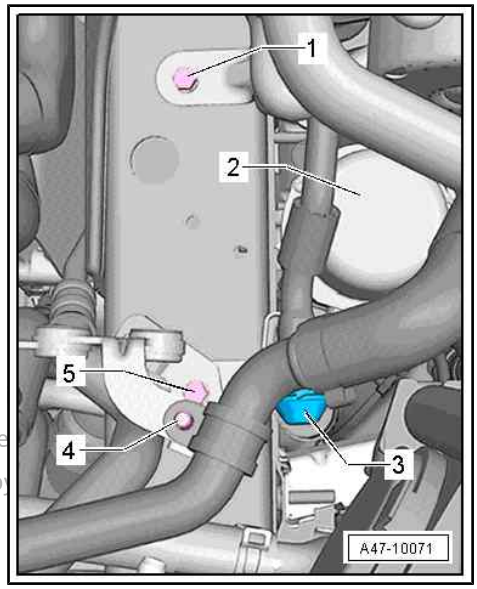
– Bolt secondary air pump hose to bracket -4-.
– Clip vacuum hose into all brackets in engine compartment.
– Raise vehicle.



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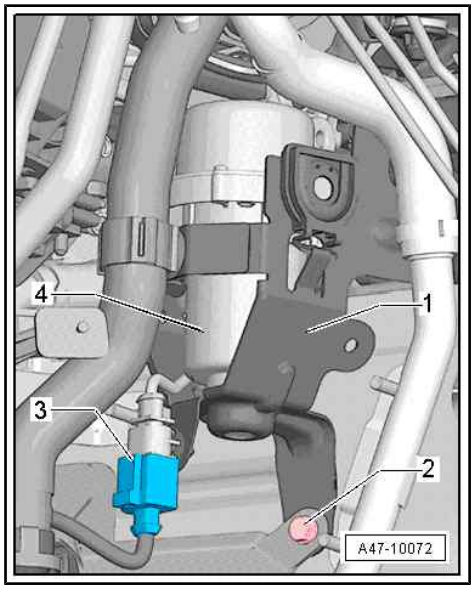
– Secure bracket -1- for vacuum pump for brakes - V192- to body with bolt -2-: 20 Nm.
– Plug in electrical connector -3- for vacuum pump for brakes - V192- -4-.
– Clip secondary air pump hose into bracket for vacuum pump for brakes - V192- .
– Install wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (rear) .
– Fit front left wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres; Tightening torque for wheel bolts .
– Lower vehicle.



4.8 Removing and installing bracket for electric vacuum pump

⇒ “4.8.1 Removing and installing bracket for electric vacuum pump - all vehicles except RS 5”, page 236

⇒ “4.8.2 Removing and installing bracket for electric vacuum pump - RS 5”, page 237

4.8.1 Removing and installing bracket for electric vacuum pump - all vehicles except RS 5

Note

The vacuum pump must be detached from the bracket prior to removing the bracket.

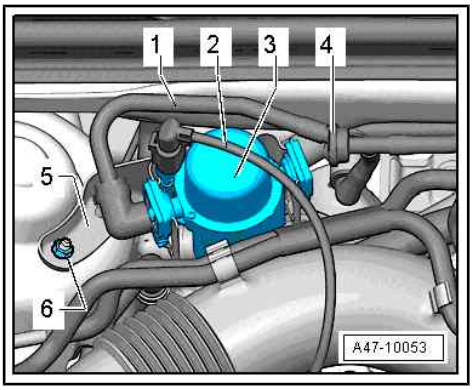
Removing

– Detach engine cover panel.

– Remove vacuum pump ⇒ page 231 .
– Remove two nuts -6- on bracket.
– Remove bracket from vehicle.

Installing

– Installation is carried out in reverse sequence.



4.8.2 Removing and installing bracket for electric vacuum pump - RS 5

Note

The bracket is removed together with the vacuum pump for brakes - V192- .

Removing

– Remove vacuum pump (RS 5) ⇒ page 233 .
– Take bracket out of vehicle together with vacuum pump for brakes - V192- .

Installing

– Installation is carried out in reverse sequence.
– Install vacuum pump (RS 5) ⇒ page 233 .

4.9 Removing and installing vacuum pump

⇒ “4.9.1 Removing and installing vacuum pump - vehicles with 2.7 ltr. TDI and 3.0 ltr. TDI diesel engine”, page 237

⇒ “4.9.2 Removing and installing vacuum pump - vehicles with 2.0 ltr. TDI engine”, page 239

⇒ “4.9.3 Removing and installing vacuum pump - vehicles with 4-cyl. turbo FSI engine”, page 242

⇒ “4.9.4 Removing and installing vacuum pump - vehicles with V6 FSI engine”, page 244

⇒ “4.9.5 Removing and installing vacuum pump - vehicles with V6 TFSI engine”, page 245

4.9.1 Removing and installing vacuum pump - vehicles with 2.7 ltr. TDI and 3.0 ltr. TDI diesel engine

Note

- *Applies for vehicles with generation I engines only.*
- *On vehicles with generation II engines, the vacuum pump is integrated in the oil pump.*

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Removing

The vacuum pump is located at the rear of the right-side cylinder bank, as seen in the direction of travel -arrow-.

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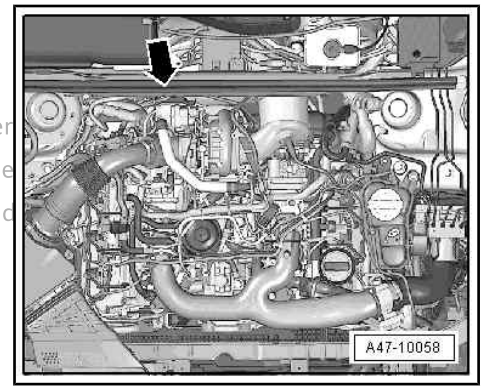
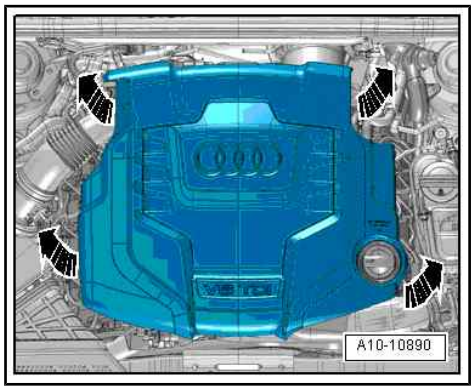


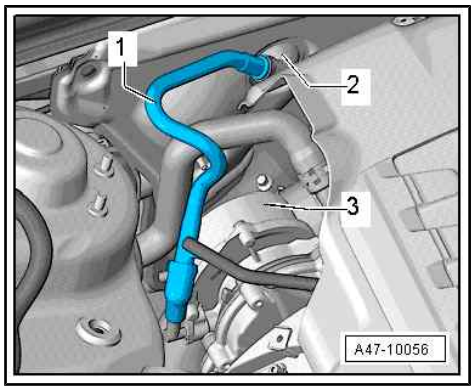
– Carefully pull engine cover panel off retaining pins one after another.



Note

Due to restricted space in the engine compartment, it is recommended to remove the vacuum pump before disconnecting the vacuum line, and to re-connect the vacuum line before installing the pump.

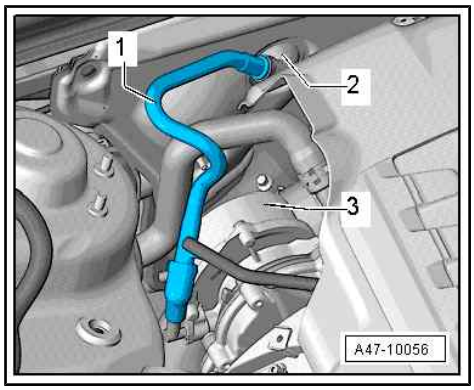
– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



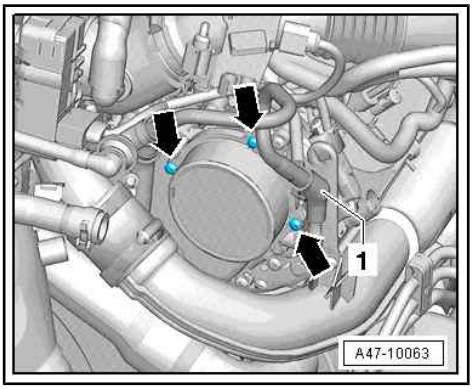
Caution

Take care not to damage the vacuum hose. The vacuum hose must be renewed if it is damaged.

– Disconnect vacuum line and vacuum hose at back of plenum chamber partition panel -2-.
– Pull vacuum line -1- out of plenum chamber partition panel -2-.



– Remove all bolts -arrows- from sealing flange of vacuum pump.
– Pull vacuum pump out of its mounting.
– Disconnect vacuum line from vacuum pump after removing pump.



Installing

Note

- *Applies for vehicles with generation I engines only.*
- *On vehicles with generation II engines, the vacuum pump is integrated in the oil pump.*

Note

Renew gasket.

Ensure that gasket is seated correctly.

– Connect vacuum line to vacuum pump before installing pump.

Pay attention to correct installation position.

– Turn drive lugs of vacuum pump so they engage in slots in camshaft when vacuum pump is installed.
– Fit vacuum pump in position.
– Make sure that gasket is seated correctly.
– Fit all bolts to sealing flange of vacuum pump and tighten. ⇒ Item 1 (page 225)
– Fit vacuum line into plenum chamber partition panel.
– Connect vacuum line and vacuum hose at back of plenum chamber partition panel.
– Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
– Install engine cover panel.

4.9.2 Removing and installing vacuum pump - vehicles with 2.0 ltr. TDI engine

Note

- *Applies for vehicles with generation I engines only.*
- *On vehicles with generation II engines, the vacuum pump is integrated in the oil pump.*
- *Removing and installing ⇒ Engine; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil pump*

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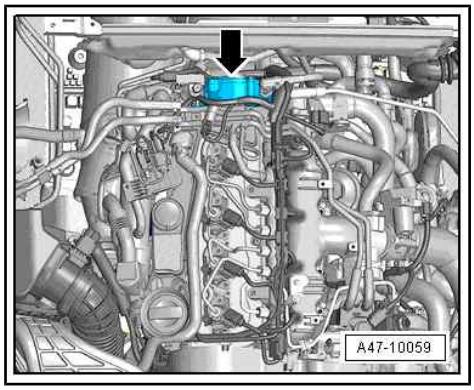
Removing

The vacuum pump is located in the rear of the engine compartment -arrow-, as seen in the direction of travel.



– Carefully detach engine cover panel.

The plenum chamber partition panel does not have to be removed.

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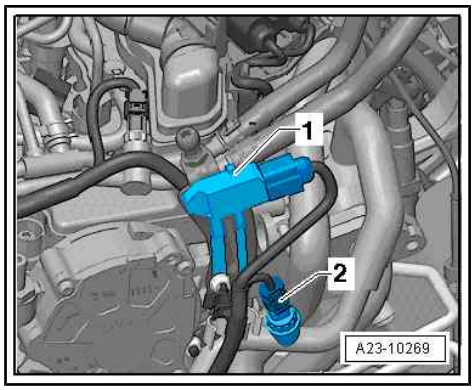
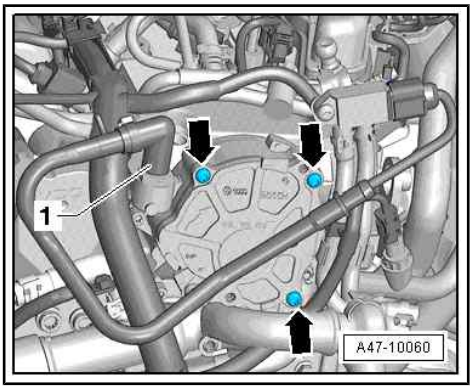
– Remove pressure sensor -1- for diesel particulate filter from bracket.
– Unclip line from pressure sensor -2- and carefully press to the side.
– Remove bracket for pressure sensor at vacuum pump.
– Unscrew coolant pipe at bracket and at left engine transportation shackle and press to the side.



– Detach vacuum hose -1- from vacuum pump.
– Remove all bolts from sealing flange of vacuum pump.
– Pull vacuum pump out of its mounting.



Installing

Note

- *Applies for vehicles with generation I engines only.*
- *On vehicles with generation II engines, the vacuum pump is integrated in the oil pump.*
- *Removing and installing ⇒ Engine; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil pump*

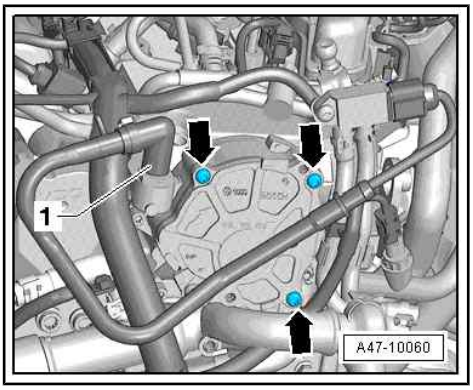
Note

Renew gasket.

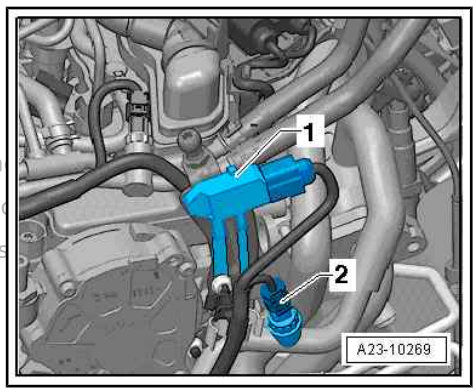
Ensure that gasket is seated correctly.

– Turn drive lugs of vacuum pump so they engage in slots in camshaft when vacuum pump is installed.
– Fit vacuum pump in position.
– Make sure that gasket is seated correctly.

– Fit all bolts -arrows- on sealing flange of vacuum pump and tighten. ⇒ Item 1 (page 225)
– Connect vacuum hose to vacuum pump.
– Screw coolant pipe into bracket and left engine transportation shackle.



– Fit bracket for pressure sensor of diesel particulate filter at vacuum pump.
– Secure bracket.
– Clip pressure sensor pipes into bracket.
– Tighten pressure sensor -1-.
– Install engine cover panel.



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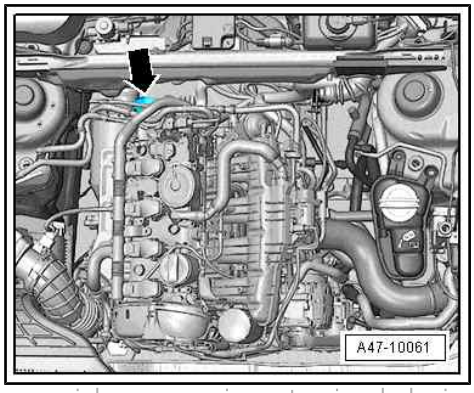
4.9.3 Removing and installing vacuum pump - vehicles with 4-cyl. turbo FSI engine

Before removing the vacuum pump, the high-pressure fuel pump must be removed ⇒ Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump .

The plenum chamber partition panel does not have to be removed.

Removing

The vacuum pump is located in the rear of the engine compartment -arrow-, as seen in the direction of travel.



WARNING

Fuel line is under pressure, do not disconnect.

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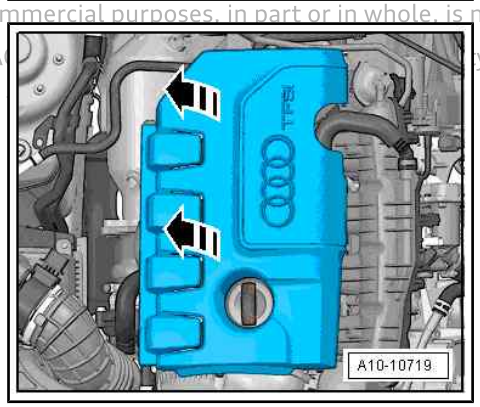
– Carefully pull engine cover panels away from retaining pins, one after the other.

The vacuum pump is located in the rear of the engine compartment on the right side, as seen in the direction of travel.

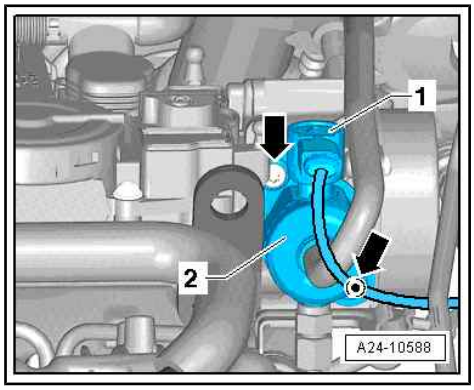


– Unplug electrical connector -1- for high-pressure fuel pump.

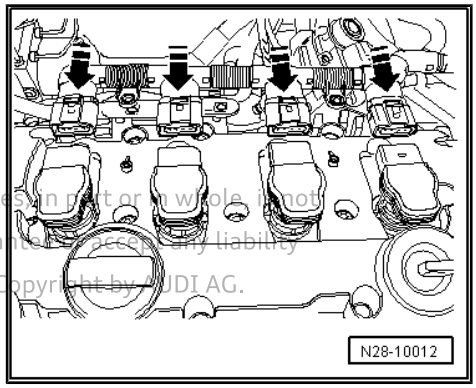
– Unclip electrical wire from bracket -arrow-.

– Remove high-pressure fuel pump -2- ⇒ Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump .

– Slacken ignition coil rail at bracket.



– Carefully unplug connectors -arrows- for ignition coils.
– Carefully press ignition coil rail to one side.
– Unscrew lines at high-pressure pump and vacuum pump and press to one side.
– Disconnect vacuum hose from vacuum pump at hose clip.



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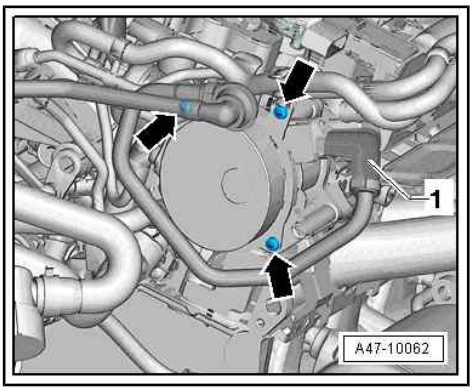
Caution

Take care not to damage the vacuum hose. The vacuum hose must be renewed if it is damaged.

– Remove all bolts -arrows- from sealing flange of vacuum pump.



Note

Do not disconnect vacuum hose from vacuum line at plenum chamber partition panel -2-.

– Pull vacuum pump out of its mounting.

Installing

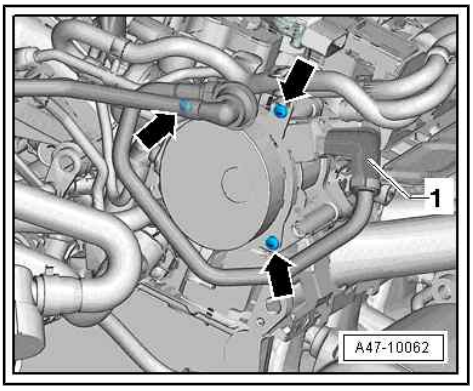
Note

Renew gasket.

Ensure that gasket is seated correctly.

– Turn drive lugs of vacuum pump so they engage in slots in camshaft when vacuum pump is installed.
– Fit vacuum pump in position.
– Make sure that gasket is seated correctly.

– Fit all bolts -arrows- on sealing flange of vacuum pump and tighten. ⇒ Item 1 (page 225)
– Slide new hose clip onto vacuum hose.
– Slide vacuum hose onto connection on vacuum pump.
– Use suitable pliers to tighten hose clip on connection of vacuum pump.

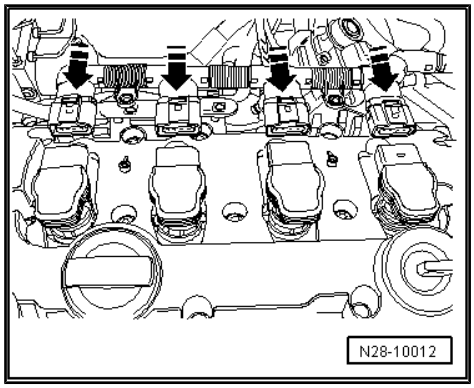


Caution

Take care not to damage the vacuum hose. The vacuum hose must be renewed if it is damaged.

– Tighten lines to high-pressure pump and vacuum pump.

– Plug in connectors -arrows- for ignition coils.
– Secure ignition coil rail.
– Install high-pressure fuel pump ⇒ Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump .
– Install engine cover panel.

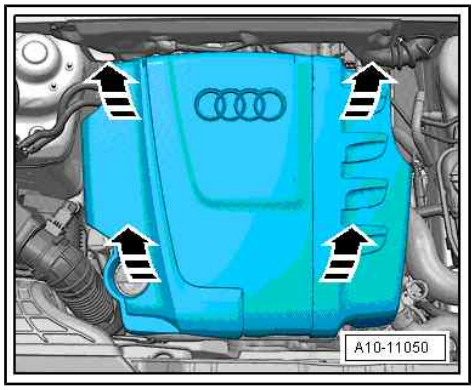


4.9.4 Removing and installing vacuum pump - vehicles with V6 FSI engine

The vacuum pump is located in the front of the engine compartment on the left side.

Removing

– Carefully pull engine cover panels away from retaining pins, one after the other.
– Slacken hose clip on vacuum hose.



Caution

Take care not to damage the vacuum hose. The vacuum hose must be renewed if it is damaged.

– Detach vacuum hose from vacuum pump.
– Slacken all bolts at sealing flange of vacuum pump and remove.
– Pull vacuum pump out of its mounting.

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Installing

Note

Renew gasket.

Ensure that gasket is seated correctly.

– Turn drive lugs of vacuum pump so they engage in slots in camshaft when vacuum pump is installed.
– Fit vacuum pump in position.
– Make sure that gasket is seated correctly.
– Fit all bolts to sealing flange of vacuum pump and tighten. ⇒ Item 1 (page 225)
– Slide new hose clip onto vacuum hose.
– Slide vacuum hose onto connection on vacuum pump.
– Use suitable pliers to tighten hose clip on connection of vacuum pump.
– Carefully fit engine cover panels into retaining pins, one after the other.

4.9.5 Removing and installing vacuum pump - vehicles with V6 TFSI engine

The vacuum pump is located in the front of the engine compartment on the left side.

Removing

– Slacken hose clip on vacuum hose.

Caution

Take care not to damage the vacuum hose. The vacuum hose must be renewed if it is damaged.

– Detach vacuum hose from vacuum pump.

– Slacken all bolts at sealing flange of vacuum pump and remove.

– Pull vacuum pump out of its mounting.

Installing

Note

Renew gasket.

Ensure that gasket is seated correctly.

– Turn drive lugs of vacuum pump so they engage in slots in camshaft when vacuum pump is installed.

– Fit vacuum pump in position.

– Make sure that gasket is seated correctly.

– Fit all bolts to sealing flange of vacuum pump and tighten.

– Slide new hose clip onto vacuum hose.

– Slide vacuum hose onto connection on vacuum pump.

– Use suitable pliers to tighten hose clip on connection of vacuum pump.

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5 Brake lines

⇒ “5.1 Routing of brake lines”, page 246

5.1 Routing of brake lines

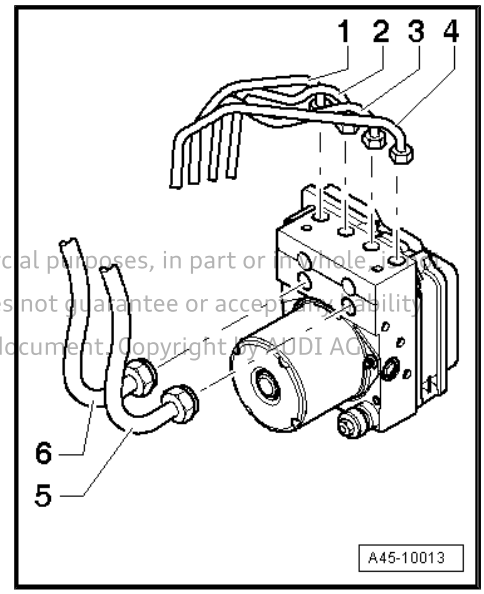
Replacement brake hoses and brake lines are supplied as spare parts ready to be installed.

Secure brake hoses and brake lines to the original mounting points when installing.

Brake lines to hydraulic unit

– Items -1- to -4- Hexagon nuts, 14 Nm tightening torque

– Items -5- and -6- Hexagon nuts, 14 Nm tightening torque



Brake hose to brake caliper at front axle

– Item -1- Brake hose; make sure that locating lugs engage properly in bracket.

– Item -2- Retaining spring

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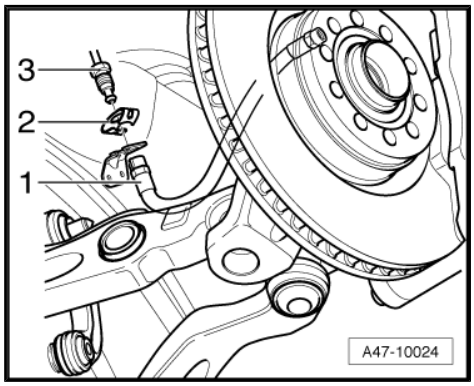
– Item -3- Brake line, 14 Nm

– Item -1- Brake line, 14 Nm

– Item -2- Retaining spring

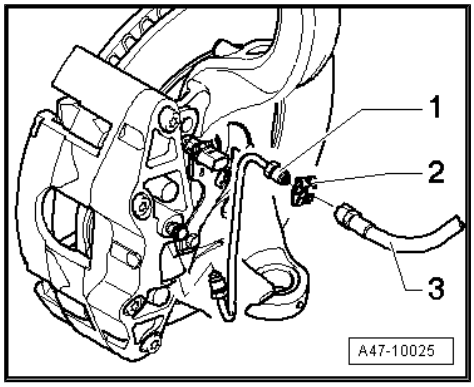


– Item -3- Brake hose; make sure that locating lugs engage properly in bracket.

Brake line routing in wheel housing at front axle

– Item -1- Brake line, 14 Nm

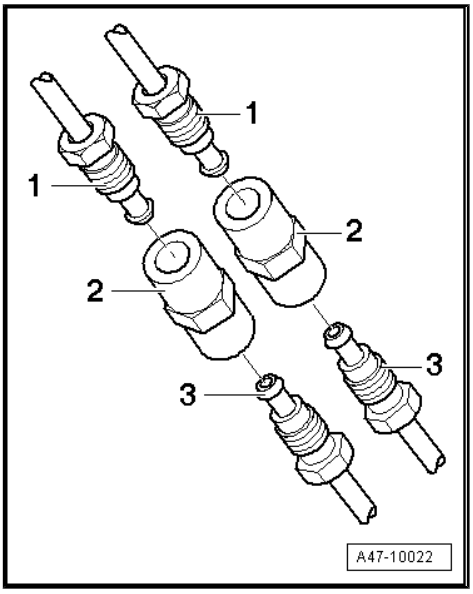
– Item -2- Connection piece



– Item -3- Brake line, 14 Nm

Brake line connection in wheel housing at front wheels

– Item -1- Brake hose retainer



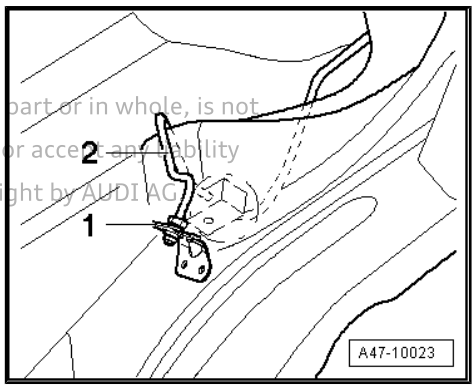
– Item -2- Brake line, 14 Nm

Routing of brake lines at rear wheels

– Item -1- Brake hose in brake caliper, 20 Nm

– Item -2- Brake hose retainer, make sure that locating lugs engage in retainer.

– Item -3- Retaining spring



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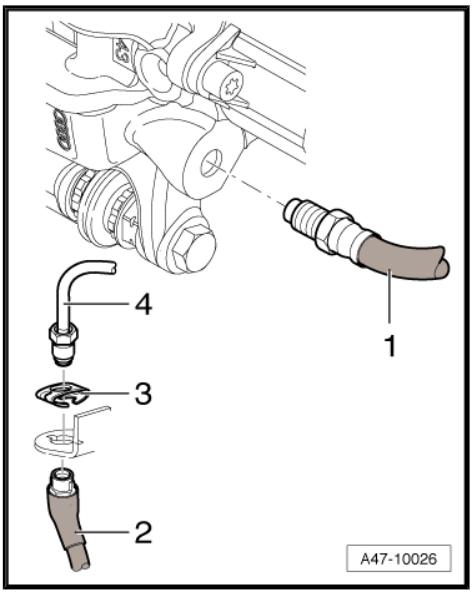
– Item -4- Brake line, 14 Nm



6 Hydraulic system

⇒ “6.1 General notes on brake fluid”, page 248

⇒ “6.2 Bleeding hydraulic system with brake filling and bleeding equipment ”, page 249

⇒ “6.3 Bleeding hydraulic system without brake filling and bleeding equipment”, page 252

⇒ “6.4 Leak test”, page 255

⇒ “6.5 High-pressure and low-pressure tests”, page 255

6.1 General notes on brake fluid

WARNING

- *Brake fluid must NOT come into contact with fluids containing mineral oils (oil, petrol, cleaning agents). Mineral oils damage the plugs and sleeves in the brake system.*
- *Brake fluid is poisonous and must NOT be drawn off by sucking through a hose. Because of its caustic properties it must also not come into contact with paintwork.*
- *Brake fluid is hygroscopic, i.e. it absorbs moisture from the surrounding air. It must therefore always be stored in airtight containers.*
- *Brake fluid flushed out during the bleeding process must not be re-used and must be disposed of in the proper manner.*
- *Always observe the relevant environmental regulations for disposal ⇒ page 248 .*

Note

- *Only use new brake fluid conforming to US standard FMVSS 116 DOT 4.*
- *Genuine VW/Audi brake fluid conforms to this specification.*
- *Do not use liquids containing silicone.*
- *Avoid contamination of brake fluid with any dirt particles or bits of fluff (e.g. from cleaning cloths etc.).*
- *Rinse off spillages using plenty of water.*
- *When the system is open, do not work with compressed air and do not move the vehicle.*
- *During the final road test, ensure that at least one ABS-controlled brake application is performed (pulsations must be felt at the brake pedal).*
- *The brake system warning lamp flashes if the level of the brake fluid is too low, in case of a malfunction of the ABS or a malfunction of the electronic parking brake.*

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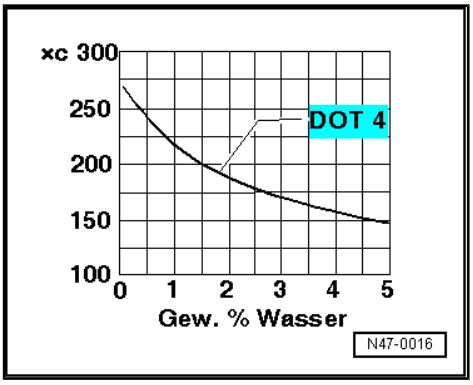
Brake fluid is hygroscopic, i.e. it has the tendency to absorb water and moisture from the atmosphere.

The boiling point decreases as the water content increases, which means a considerable rise in brake fluid temperature can lead to formation of vapour bubbles and brake failure.



The colour of the brake fluid becomes darker over the course of time. A dark brake fluid colour is not an indication of its condition. The change in colour is caused by chemical reactions.

WARNING

Rubber parts of brake system (sleeves, seals) are not compatible with mineral oil, fuel and cleaning agents.

Even minute quantities coming into contact with a seal or sleeve will affect the component and could impair brake operation. The consequences of a contaminated brake system only become apparent months later, and then give rise to greater expenses, particularly in vehicles equipped with ABS.

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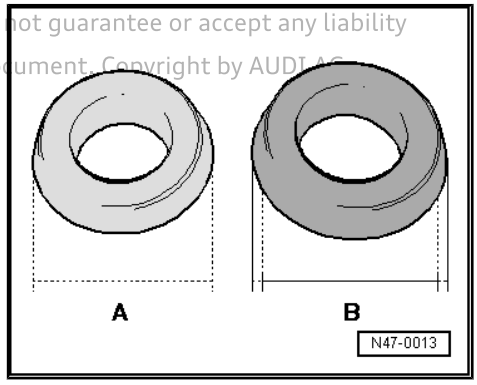
A = Sleeve (original size)

B = Sleeve (swollen due to contact with mineral oil)



Summary of the above mentioned points:

Always keep brake fluid containers properly sealed. This is the only way of preventing contamination by oil, dirt, cleaning agents or moisture.

Brake fluid containers should be kept completely separate from oils (including hydraulic fluid) and cleaning agents to prevent any mixture of fluids or even filling of the brake system with an incorrect fluid.

We recommend using brake fluid approved by Audi ⇒ ETKA .

Brake fluid change

⇒ Maintenance ; Booklet 405 ; Work descriptions; Changing brake fluid (every 2 years)

6.2 Bleeding hydraulic system with brake filling and bleeding equipment

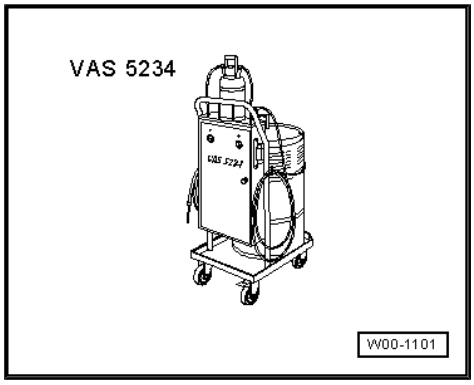
Note

- *A pressure of 2 bar is required to bleed the hydraulic unit - N55-. For this reason it is important to always check the pressure setting on the bleeder unit.*
- *Observe instructions given in operating manual for - VAS 5234- or brake filling and bleeding equipment - VAS 6860- .*

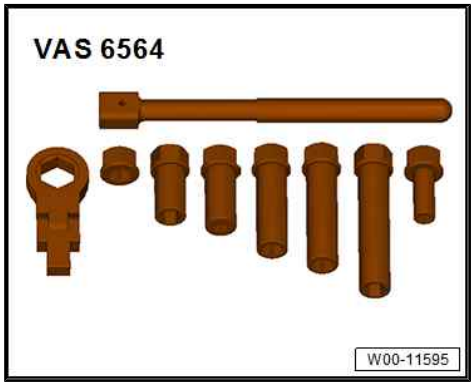
Special tools and workshop equipment required

- -VAS 5234- Brake filling and bleeding equipment

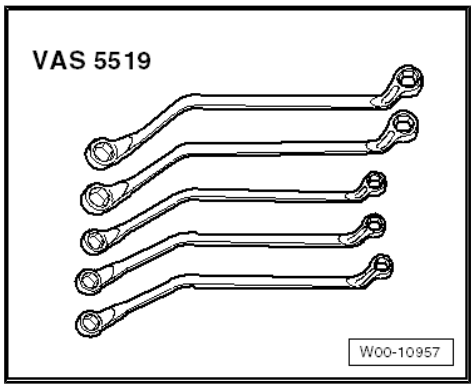
- -VAS 5234/1- Adapter



- Or
- Brake filling and bleeding equipment - VAS 6860- with adapter - VAS 5234/1A-
- Tool set for brake bleeding - VAS 6564-



- Brake pipe bleeding wrench - VAS 5519-



Observe instructions given in operating manual for -VAS 5234- or brake filling and bleeding equipment - VAS 6860- .

Procedure

– Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover.

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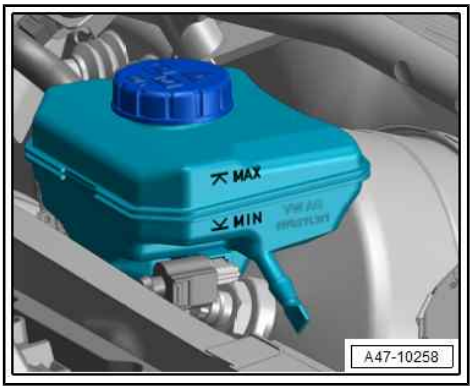
– Fill brake fluid into brake fluid reservoir up to “max” marking.



– Connect -VAS 5234- or brake filling and bleeding equipment - VAS 6860- with adapter -VAS 5234/1- .

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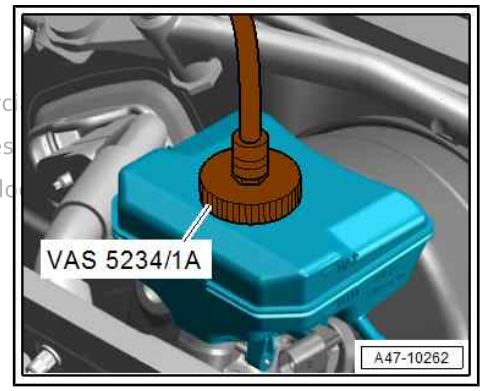
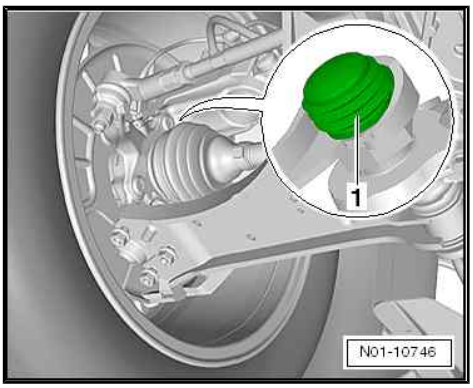


– Remove protective cap -1- from bleeder screw on relevant brake caliper and fit hose from reservoir onto bleeder screw.



Bleeding sequence

1 - Front left brake caliper

2 - Front right brake caliper

3 - Rear left brake caliper

4 - Rear right brake caliper

Note

Bleed brake caliper at each bleeder screw. If brake caliper has two bleeder screws, first bleed at outer screw.

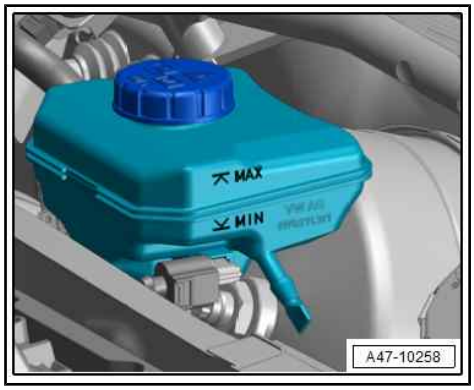
– Repeat bleeding procedure in stated sequence at other brake calipers.

– Keep bleeding the calipers until clear, foam-free brake fluid emerges.

– Close bleeder screws.

– Lower vehicle.

– Fill brake fluid into brake fluid reservoir up to “max” marking.
– Close reservoir.
– Start engine and check brake pedal travel and brake pedal pressure.
– In the event of excessive pedal travel, check brake system for leaks and/or repeat bleeding procedure.
– Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



WARNING

Risk of accident!

- *Make sure that the brakes work properly before the vehicle is driven on the road.*

6.3 Bleeding hydraulic system without brake filling and bleeding equipment

Special tools and workshop equipment required

- Reservoir -1-

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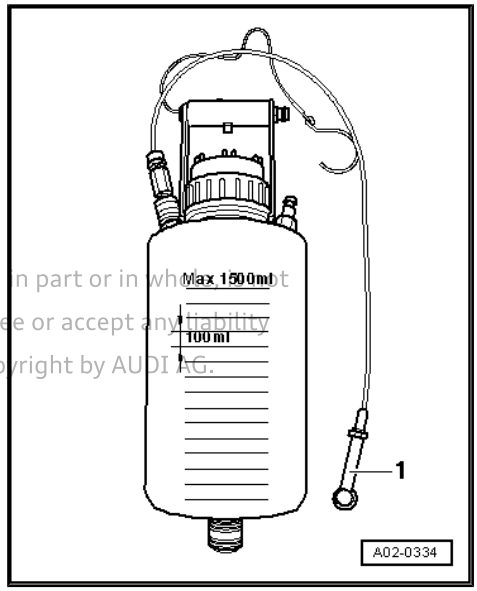
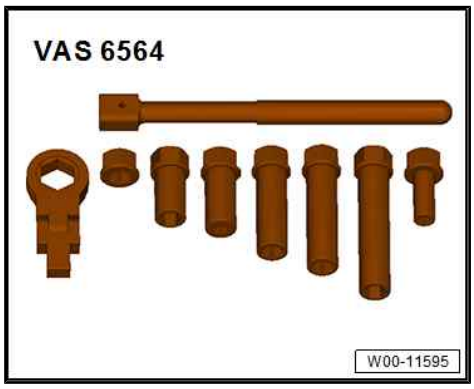
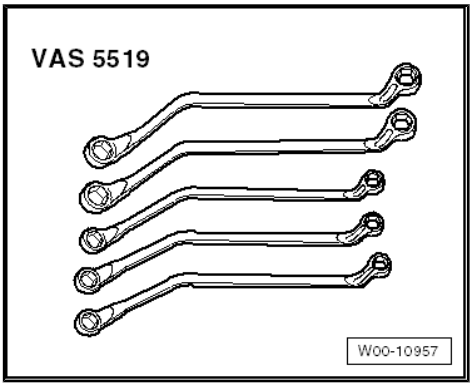


- Tool set for brake bleeding - VAS 6564-



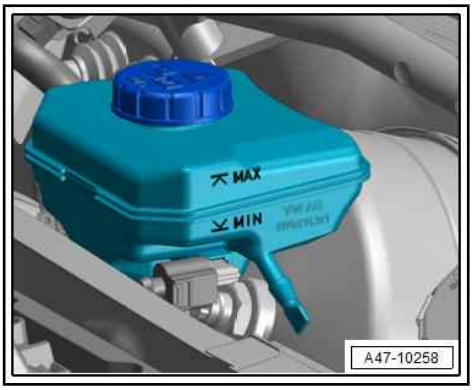
- Brake pipe bleeding wrench - VAS 5519-



Procedure

– Fill brake fluid into brake fluid reservoir up to “max” marking.

– Close reservoir.



WARNING

- *Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.*
- *If brake fluid comes into contact with skin, rinse with plenty of water.*
- *If you get brake fluid in your eyes, rinse your eyes out and consult a doctor.*

Note

Make sure brake fluid reservoir is always full.

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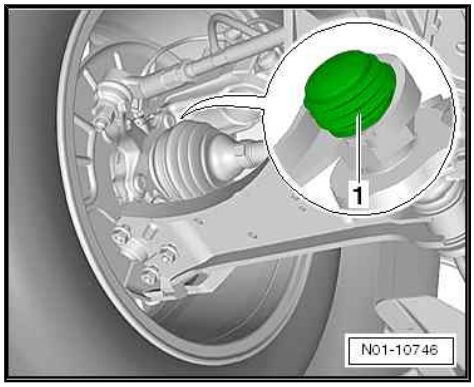
– Remove protective cap -1- from bleeder screw on relevant brake caliper and fit hose from reservoir onto bleeder screw.



Bleeding sequence

1 - Front left brake caliper

2 - Front right brake caliper

3 - Rear left brake caliper

4 - Rear right brake caliper

Note

Bleed brake caliper at each bleeder screw. If brake caliper has two bleeder screws, first bleed at outer screw.

– Build up pressure in brake system by pumping brake pedal.

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Note

Press brake pedal slowly to avoid formation of bubbles.

– Once pressure has built up, keep brake pedal depressed.

– Open bleeder screw with hose of reservoir attached until pressure has dissipated (pedal sags).

– Keep pedal depressed and close bleeder screw.

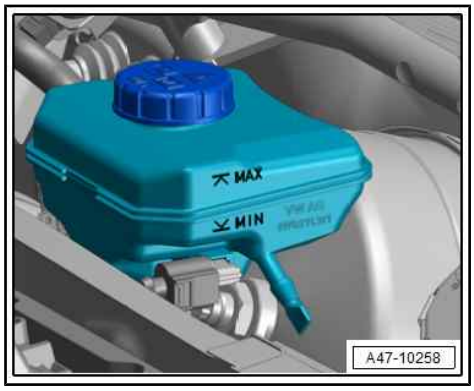
– Release brake pedal and wait approx. 2 seconds to allow brake fluid to flow in from brake fluid reservoir.

– Repeat procedure until emerging brake fluid is clear and free from bubbles.

– Tighten bleeder screw, detach bleeder hose and fit protective cap on bleeder screw.

– Repeat bleeding procedure in stated sequence at other brake calipers.

– Fill brake fluid into brake fluid reservoir up to “max” marking.



– Close reservoir.

– Start engine and check brake pedal travel and brake pedal pressure.

– In the event of excessive pedal travel, check brake system for leaks and/or repeat bleeding procedure.

WARNING

Risk of accident!

- ***Make sure that the brakes work properly before the vehicle is driven on the road.***

6.4 Leak test

Note

- *The hydraulic brake system must be bled.*
- *Only genuine parts or components approved by Audi may be installed within the brake system.*
- *The brake fluid must be changed if the replacement interval specified by Audi for brake fluid is exceeded.*
- *Perform a visual inspection to check the brake system for leaks.*
- *Repair any leaks found and remove any accumulated dirt from the hydraulic system.*

– Switch off engine.

– Press brake pedal repeatedly (“pump” the vacuum out of the brake servo) until there is no more servo assistance and the brake pedal is heavy.

– Press the brake pedal down approx. 20 mm out of the rest position.

– Keep the force on the pedal constant for about 20 seconds.

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The brake pedal travel should not become longer.

– Release brake pedal.

– Press pedal with substantial foot pressure.

– Keep the force on the pedal constant for about 20 seconds.

The brake pedal travel should not become longer.

The visual inspection of the brake system must be repeated if the brake pedal resistance collapses during any of the tests.

If no leaks are then found during the test, the brake master cylinder probably has a leak and must be renewed.

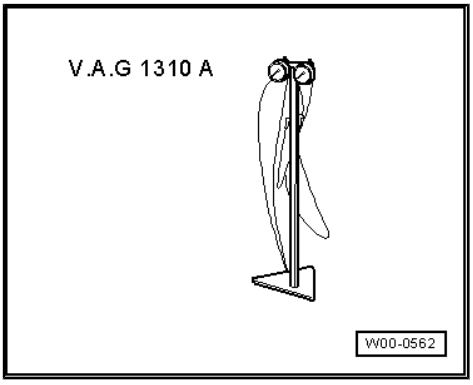
Caution

Ensure that no brake fluid enters the brake servo when renewing the brake master cylinder.

6.5 High-pressure and low-pressure tests

Special tools and workshop equipment required

- Tester for brake pressure regulator - V.A.G 1310A-

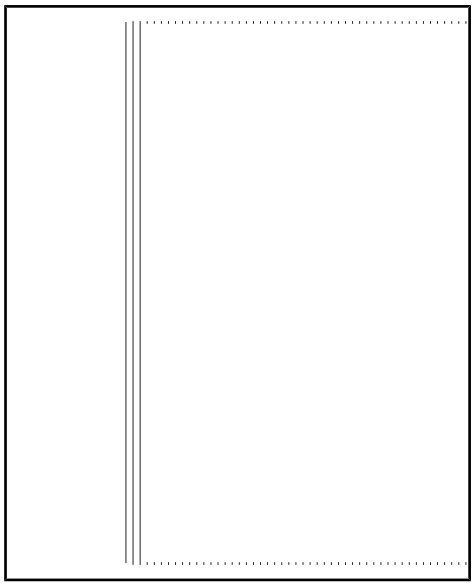


Before starting:

Make sure that the brake system (master cylinder, brake hoses, brake lines and brake calipers) works properly and is free of leaks.

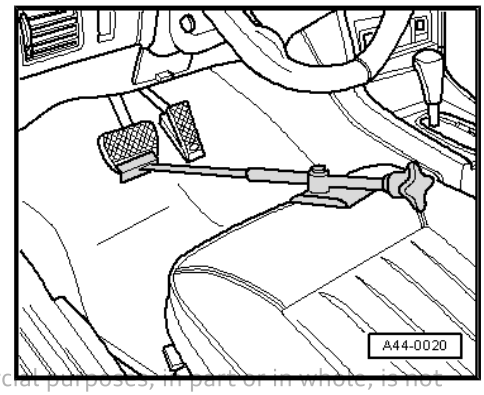
High-pressure test:

– Remove bleeder screw at one of the front brake calipers. Connect tester for brake pressure regulator - V.A.G 1310A- and bleed tester.



– Insert brake pedal actuator -V.A.G 1869/2- between brake pedal and driver's seat.

– Apply pressure to brake pedal until the gauge indicates a pressure of 50 bar.



The pressure must not drop by more than 4 bar during the test period of 45 seconds.

Renew hydraulic unit if drop in pressure exceeds the above figure.

Low-pressure test:

– Move the brake pedal actuator -V.A.G 1869/2- back until the pressure gauge indicates a pressure of 6 bar.

– The pressure should not drop by more than 1 bar within the test period of 3 minutes.

Renew hydraulic unit if drop in pressure exceeds the above figure.

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