



Vehicle

System

Repair Group

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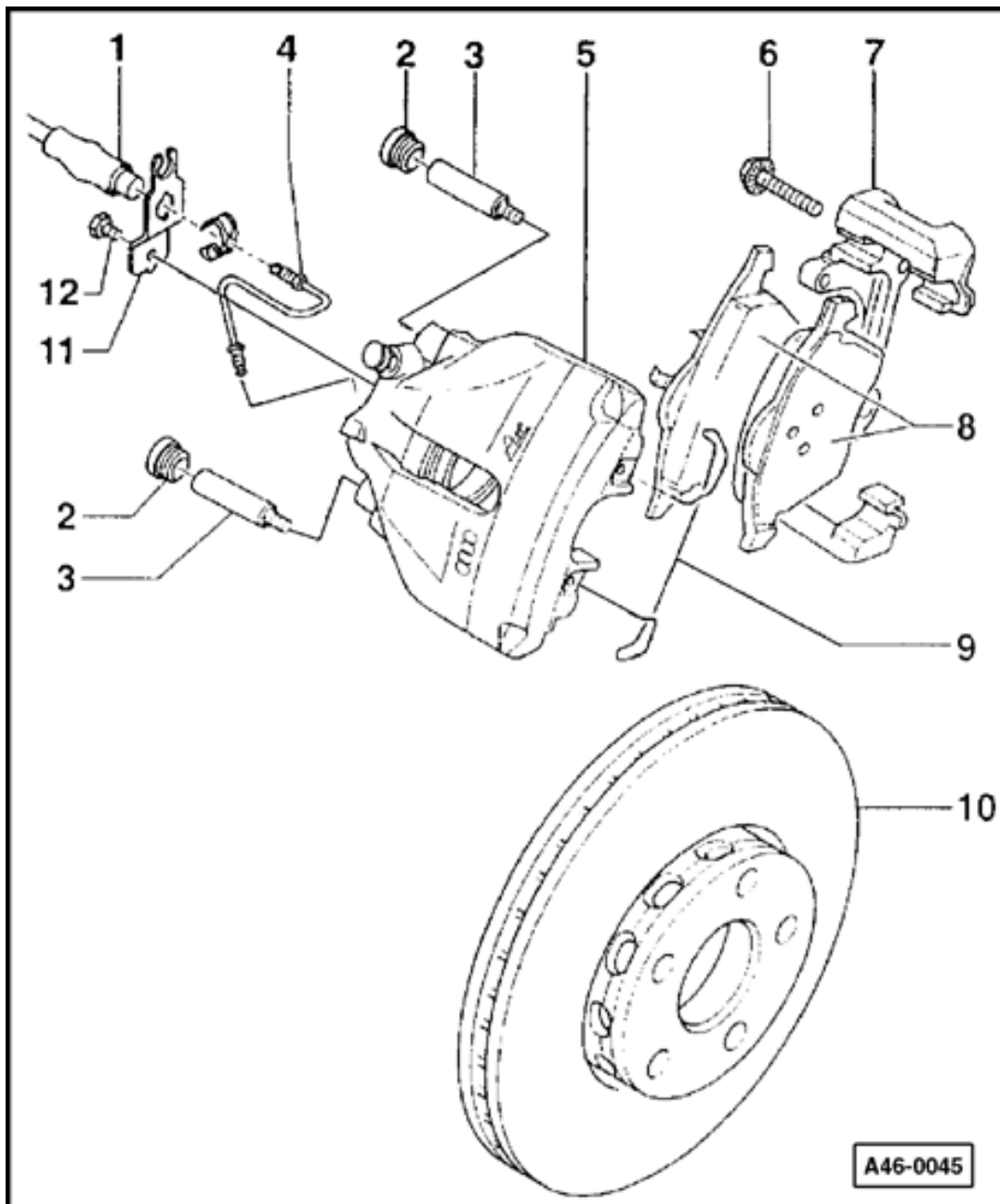
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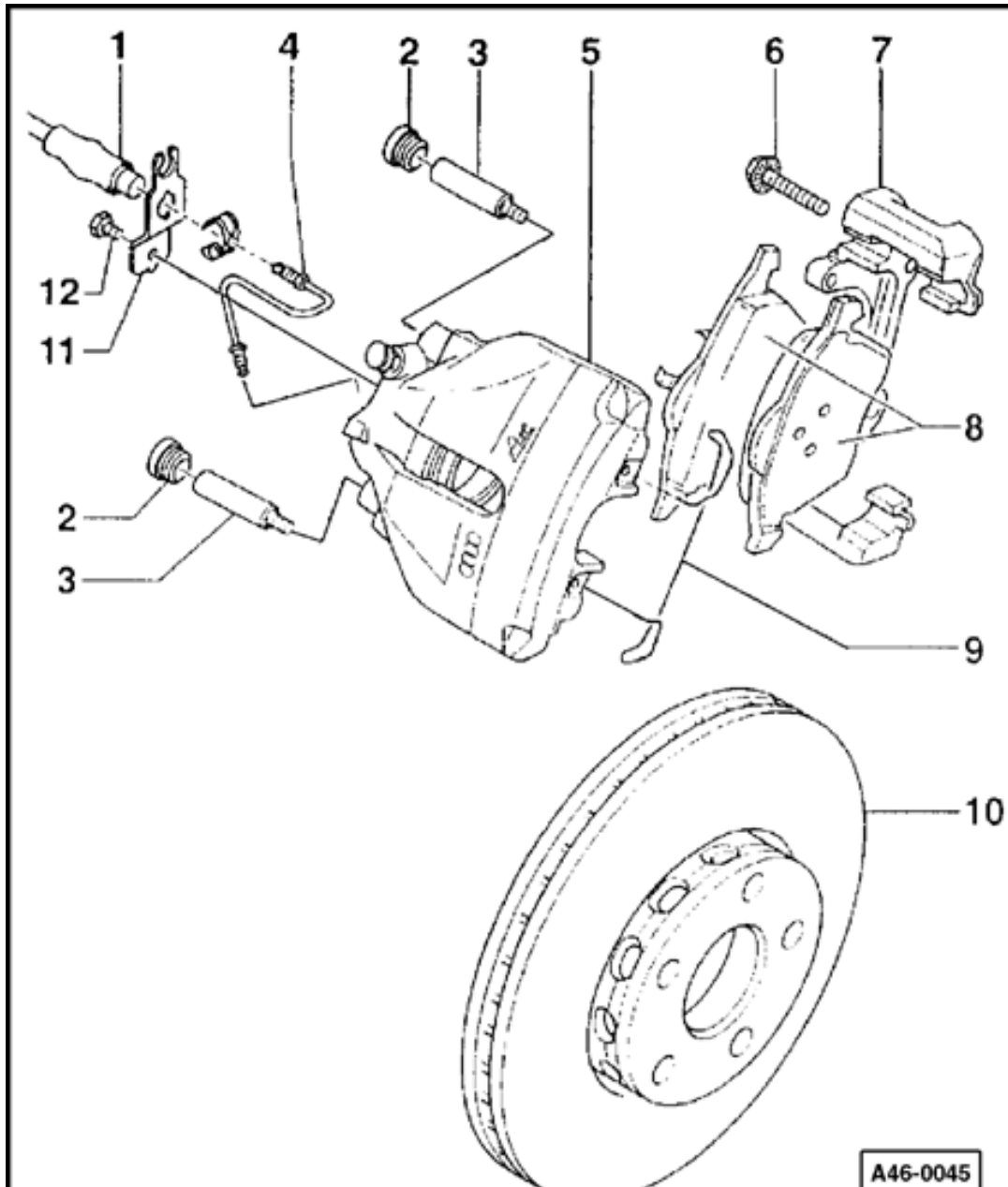


## Front brakes (FN-3), servicing

### Front brakes, servicing

**Note:**

- ◆ *Install complete repair kit.*
- ◆ *After replacing brake pads and before moving vehicle, depress brake pedal several times firmly to properly seat brake pads in their normal operating position.*
- ◆ *When siphoning brake fluid, always use a bleeder bottle that is used exclusively for brake fluid. Brake fluid is poisonous. NEVER siphon brake fluid with your mouth!*
- ◆ *Wheel bolt tightening torque: 120 Nm*
- ◆ *Check brake caliper for freedom of movement by sliding to side.*



**1 - Brake hose**

- ◆ Do not disconnect when removing brake pads

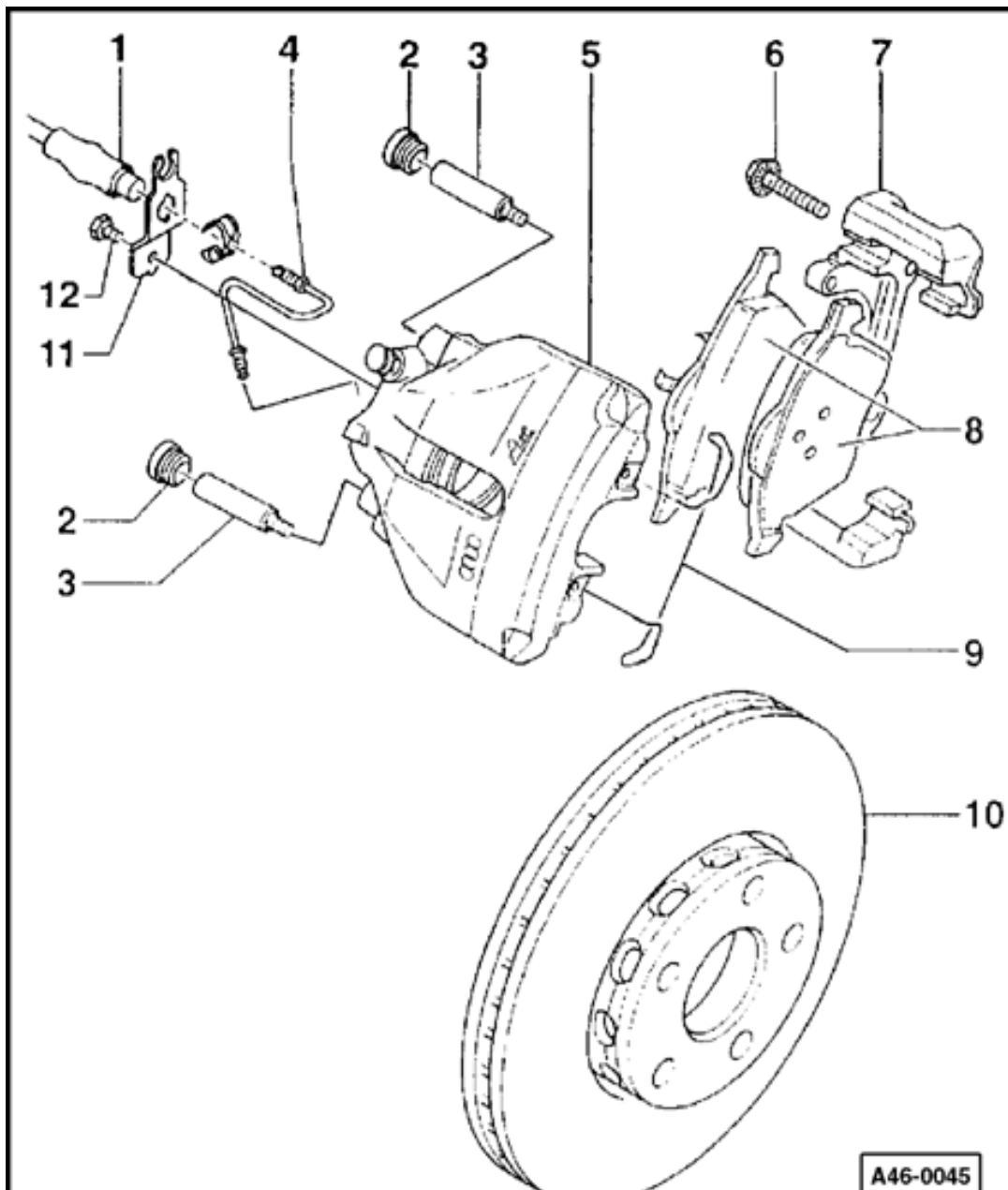
**2 - Protective cap**

- ◆ Remove

**3 - Guide pins, 25 Nm**

**4 - Brake line, 15 Nm**

- ◆ Install in brake caliper housing
- ◆ Attach to brake hose, counter hold on brake hose hex when attaching
- ◆ Make sure tabs are properly seated in retainer grooves



### 5 - Brake caliper housing

- Check that the brake calipers moves freely by moving it from side to side

### 6 - Ribbed bolt, tightening torques

#### **CAUTION!**

**Observe different tightening torques.**

- ◆ M12 x 1.5 x 35, 130 Nm
- ◆ M14 x 1.5 x 35, 200 Nm
- ◆ Clean ribs if reusing

### 7 - Brake carrier

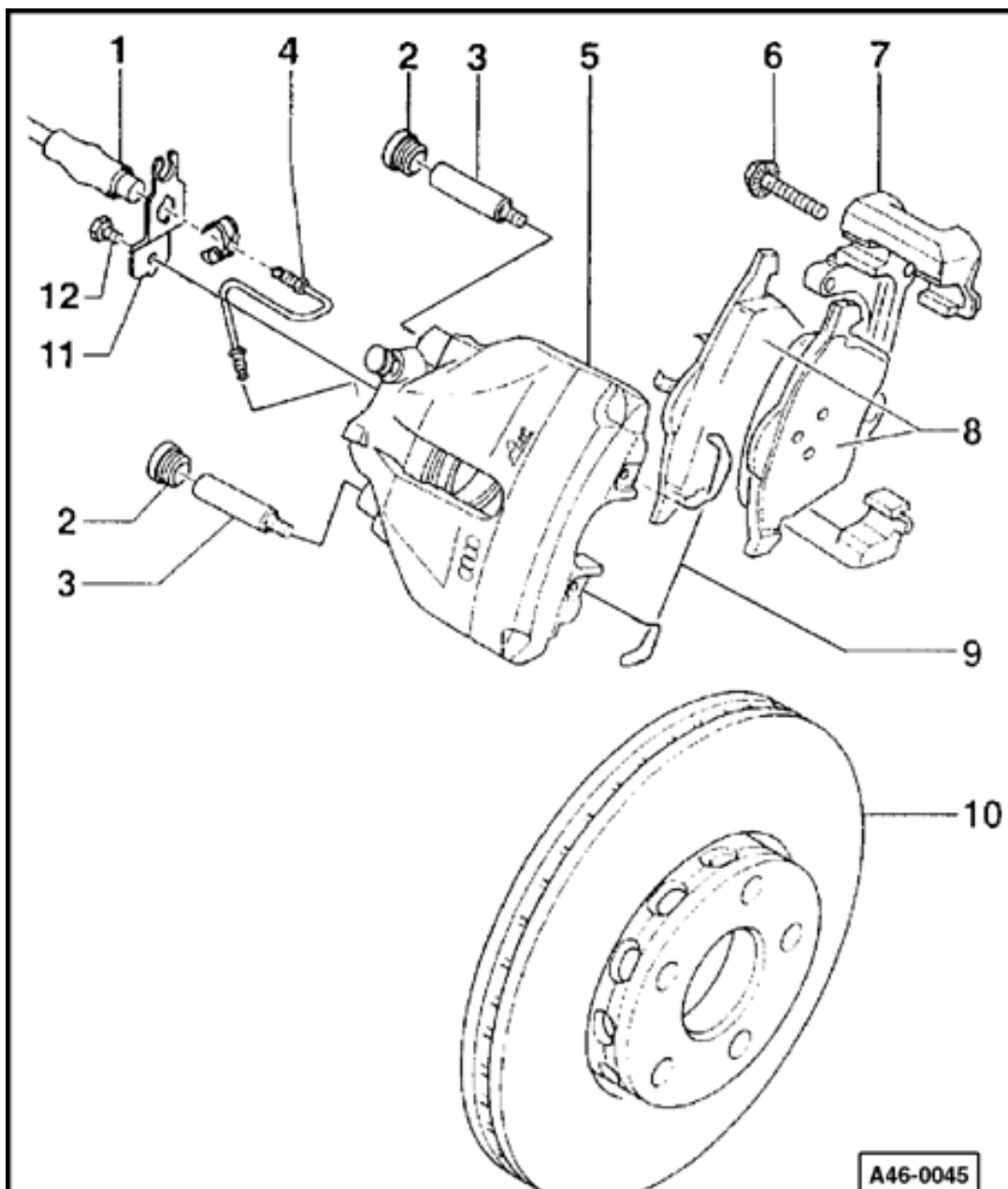
- ◆ Bolt to wheel bearing housing



- ◆ Always replace on both sides of the car

⇒ [Repair Manual, Brake System, Repair Group 00; Technical data](#)

- ◆ Removing and installing ⇒ [Page 46-7](#)



## 8 - Brake pads

### **Note:**

*Inner pad (with spring) is marked with an arrow. The arrow must point in the direction of forward rotation of the brake disc when installed. Noise may result from incorrect installation.*

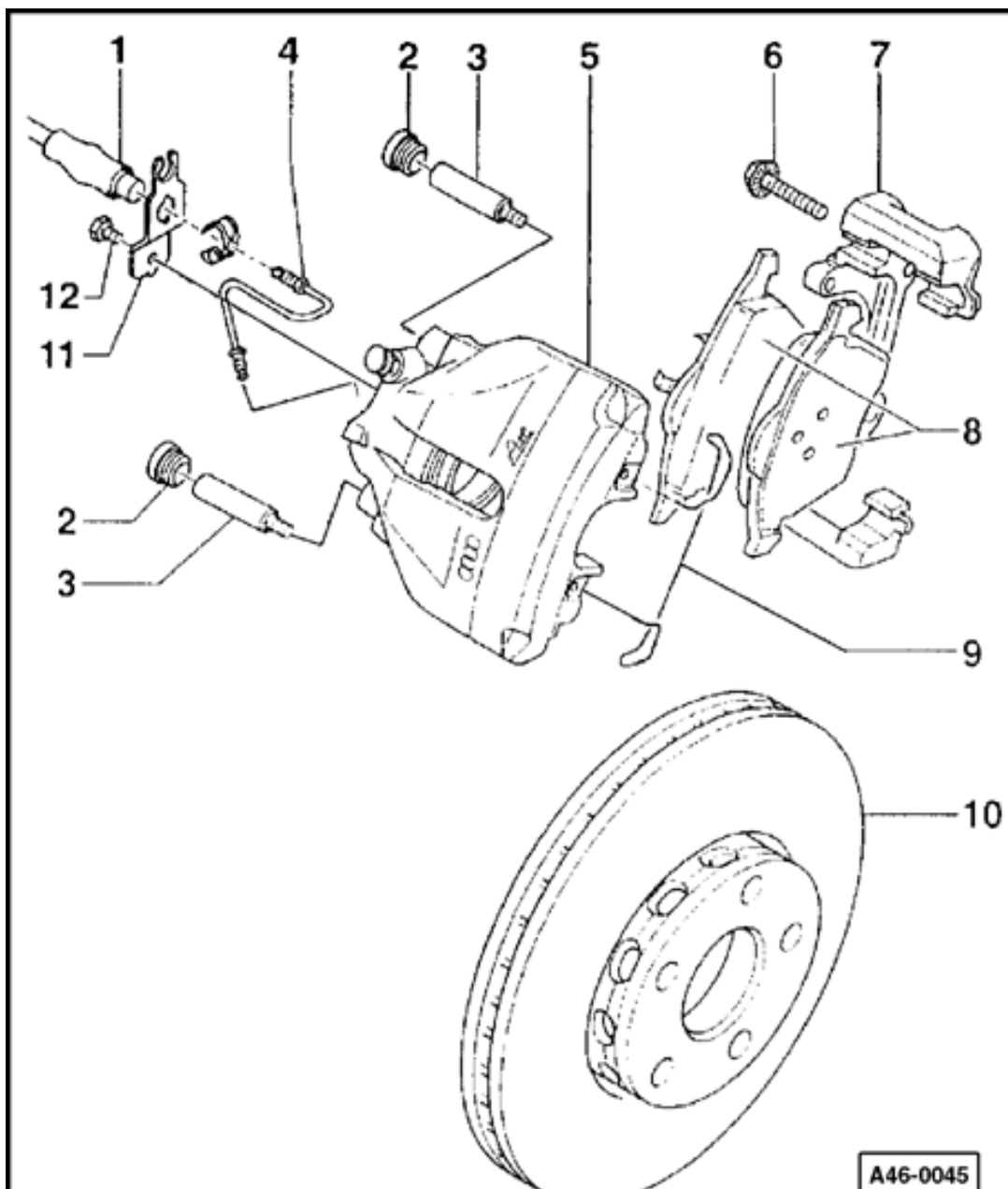
- ◆ Remove adhesive foil from backing plates on outer brake pads before installing
- ◆ Both pairs of brake pads on front axle must always be replaced together

### **Note:**

*Always clean brake caliper thoroughly before installing new brake pads (must be free of grease). Be especially*



*careful to remove any residual adhesive foil on the surface of the outer brake pads.*

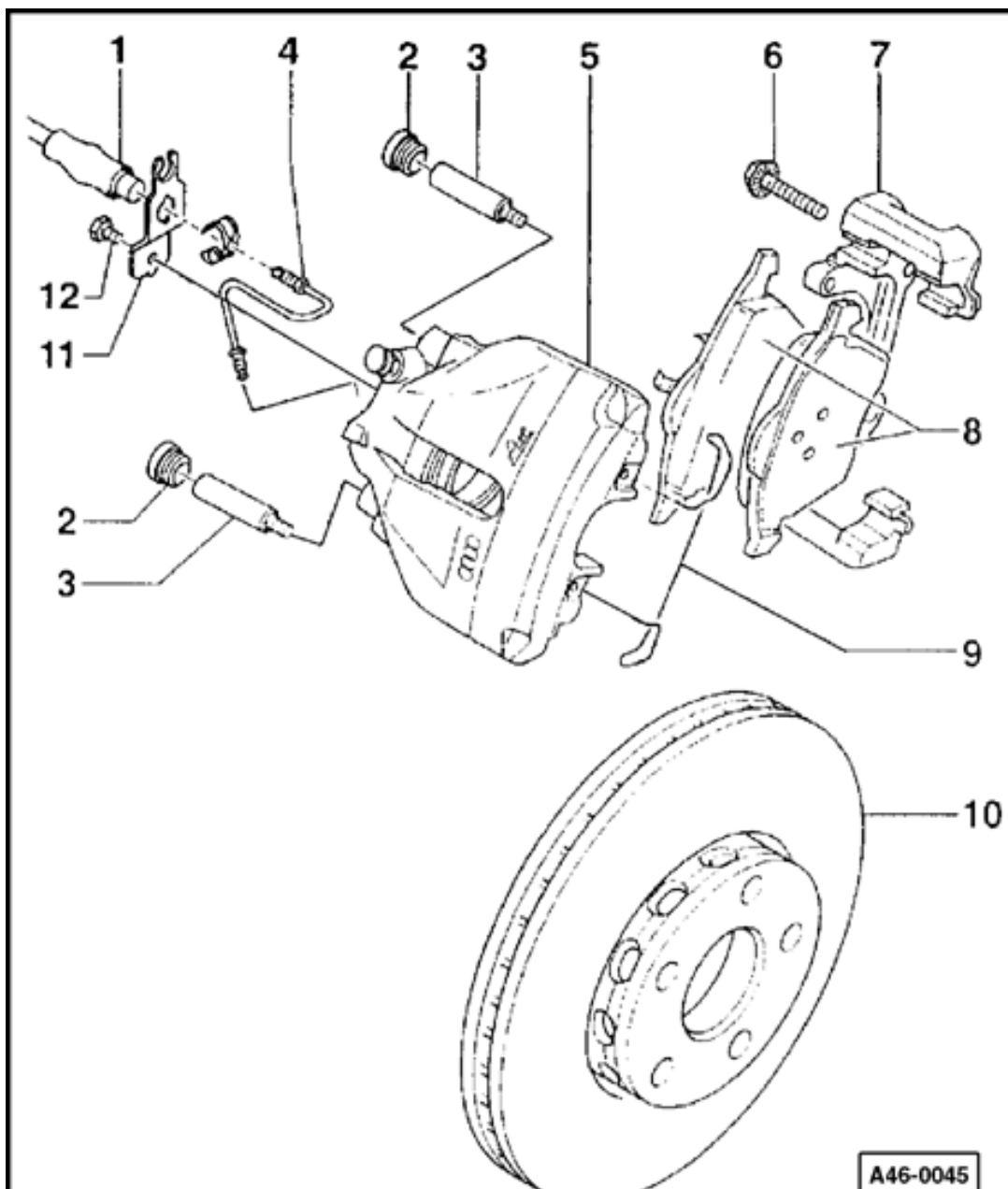


### 9 - Retaining spring

- ◆ Insert in both holes of brake caliper housing

#### **Note:**

*Retaining spring must be pressed under brake carrier after it is inserted in both holes. If the spring is improperly installed, the brake caliper cannot adjust to compensate for wear on the outer brake pad. This will cause the brake pedal travel to increase.*



### 10 - Brake disc

- ◆ Pads on both sides of axle must always be replaced together
- ◆ Remove brake caliper before removing

⇒ [Repair Manual, Brake System, Repair Group 00; Technical data](#)

- ◆ Pads on both sides of axle must always be replaced together
- ◆ Brake pads are different; inner pad has retaining spring

### 11 - Bracket

- ◆ Bolt to brake caliper housing

### 12 - Hex bolt, 10 Nm



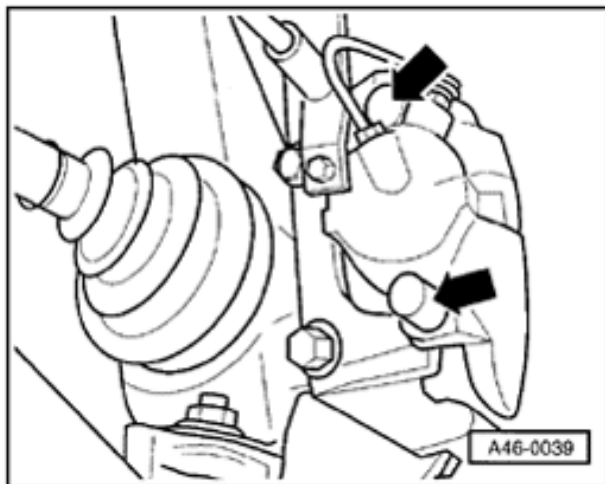


## Brake pads, removing and installing

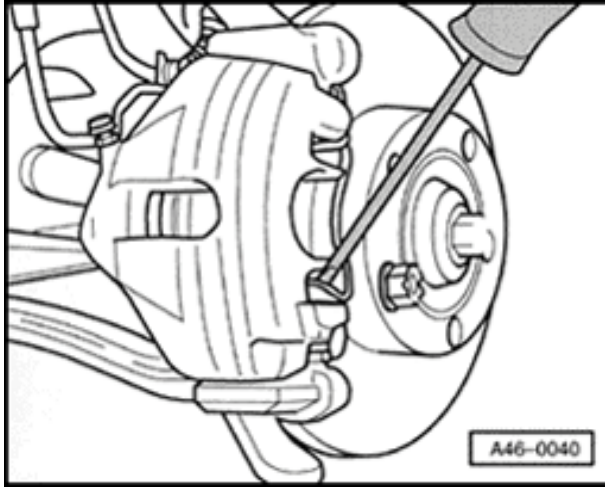
### Removing

#### **Note:**

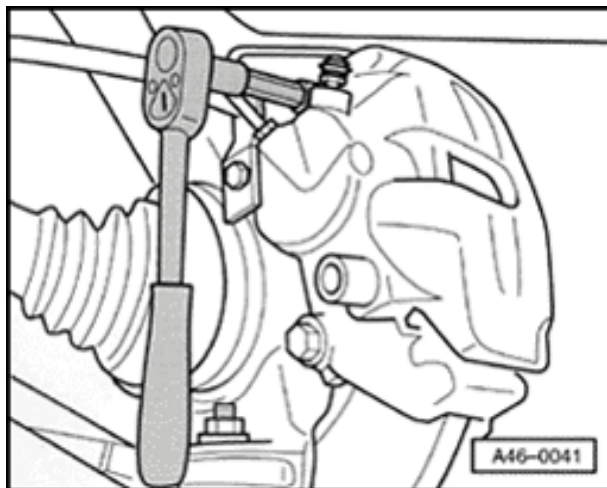
*If re-using brake pads, mark them so they can be installed in their original positions to prevent uneven braking.*



- Remove protective caps.



- ✦ - Using screwdriver, pry off brake pad retaining spring from brake caliper housing and remove.

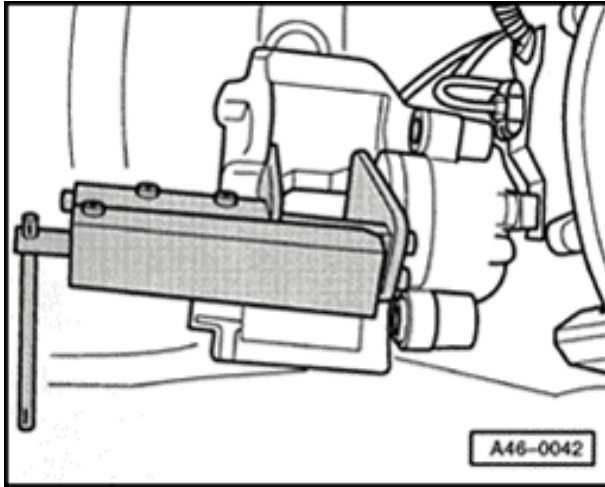


- Remove both guide pins from brake caliper.
- Remove brake caliper housing and support so that the weight of the brake caliper does not burden or damage the brake hose.
- Remove brake pads from brake caliper housing or from brake carrier.

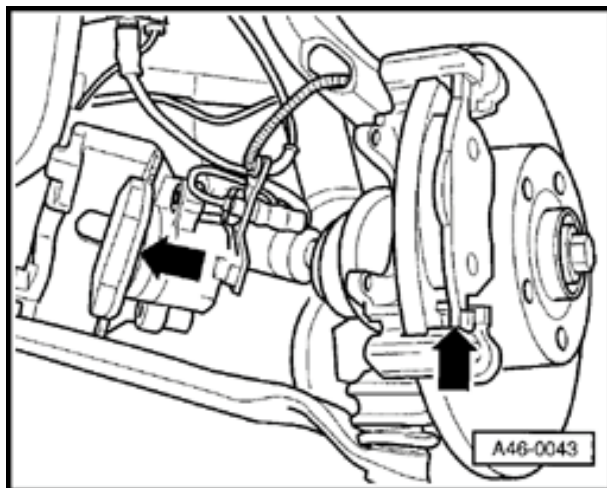
### Installing

#### **Note:**

*Press piston back into caliper housing using resetting tool before inserting new brake pads. Before pushing back the piston, draw off brake fluid out of the brake fluid reservoir with a bleeder bottle. Otherwise, especially if reservoir has been topped off, fluid will overflow and cause damage.*



- ▶ - Press piston back.



- Insert brake pad with retaining spring in brake caliper housing.

**Note:**

*Inner pad (with spring) is marked with an arrow. The arrow must point in the direction of forward rotation of the brake disc when installed. Noise may result from incorrect installation.*

- Remove protective foil on backing plate of outer brake pad.
- Install outer brake pad on brake carrier.
- Install brake caliper housing in brake carrier using both guide pins (25 Nm).
- Install both protective caps.
- Install retaining spring in brake caliper housing.

**Note:**

*After installing brake pads and before moving vehicle, depress brake pedal several times firmly to properly seat brake pads in their normal operating position.*

- Install  
wheels

Tightening torque 120  
Nm

- Check brake fluid level and top off, if  
necessary.



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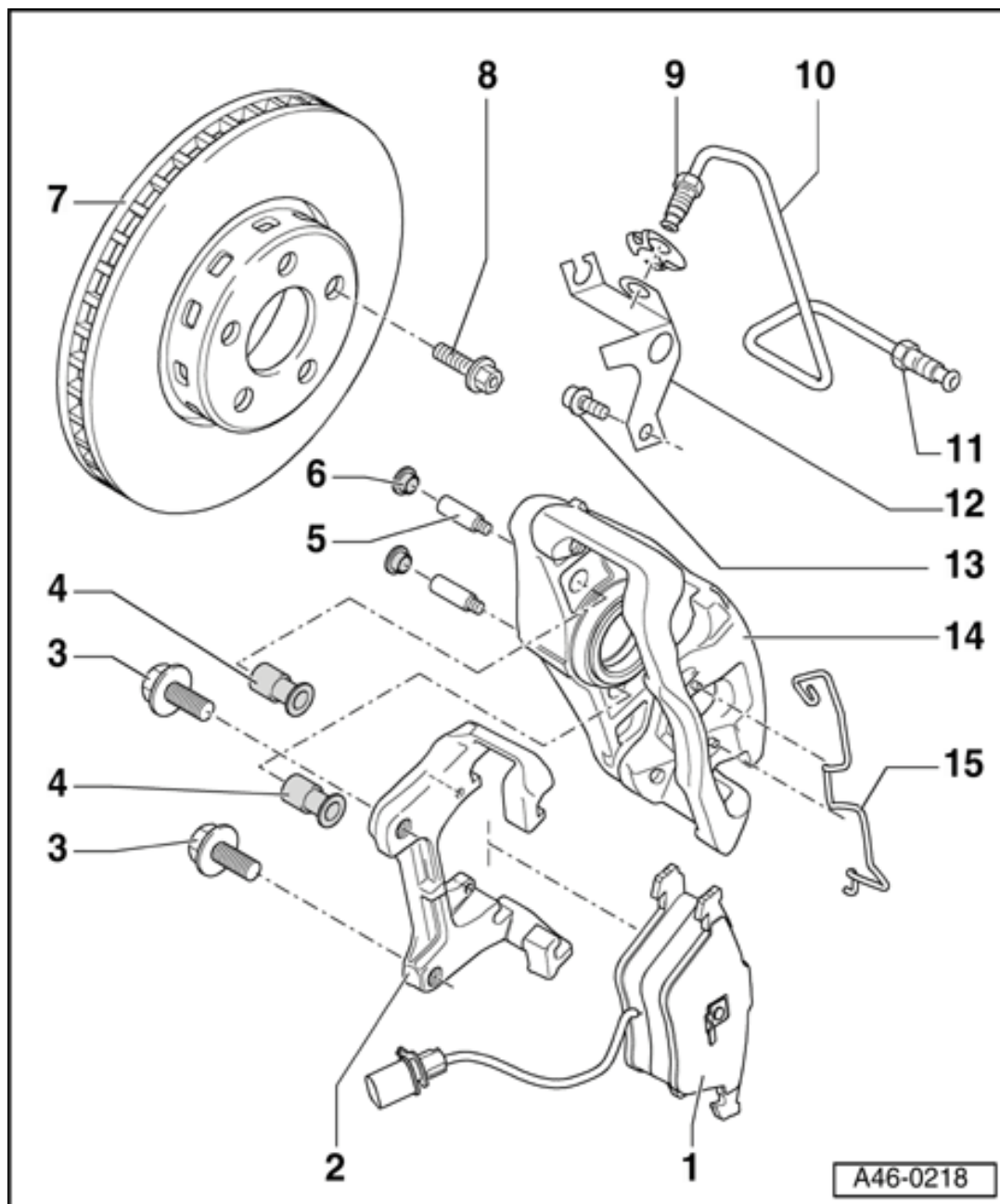
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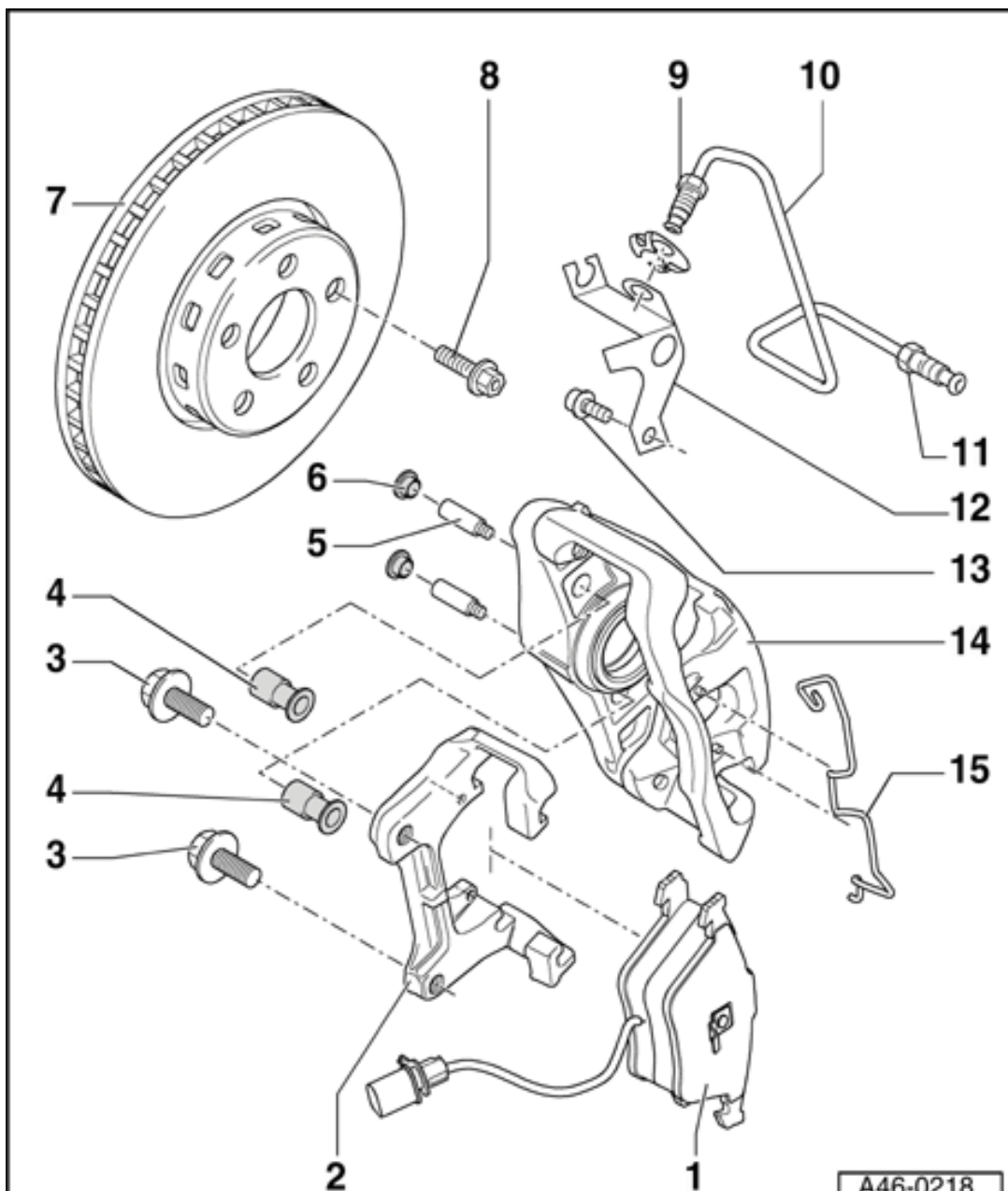


## Front brakes FNR-G60

### Front brakes, servicing

#### Note:

- ◆ Always install the complete repair kit.
- ◆ After replacing brake pads and before moving vehicle, depress brake pedal several times firmly to properly seat brake pads in their normal operating position.
- ◆ When siphoning brake fluid, always use a bleeder bottle that is used exclusively for brake fluid. Brake fluid is poisonous. NEVER siphon brake fluid with your mouth!



A46-0218

- ◆ The tightening torque of the brake lines is 15 Nm.
- ◆ Check that the brake caliper moves freely by moving it from side to side.

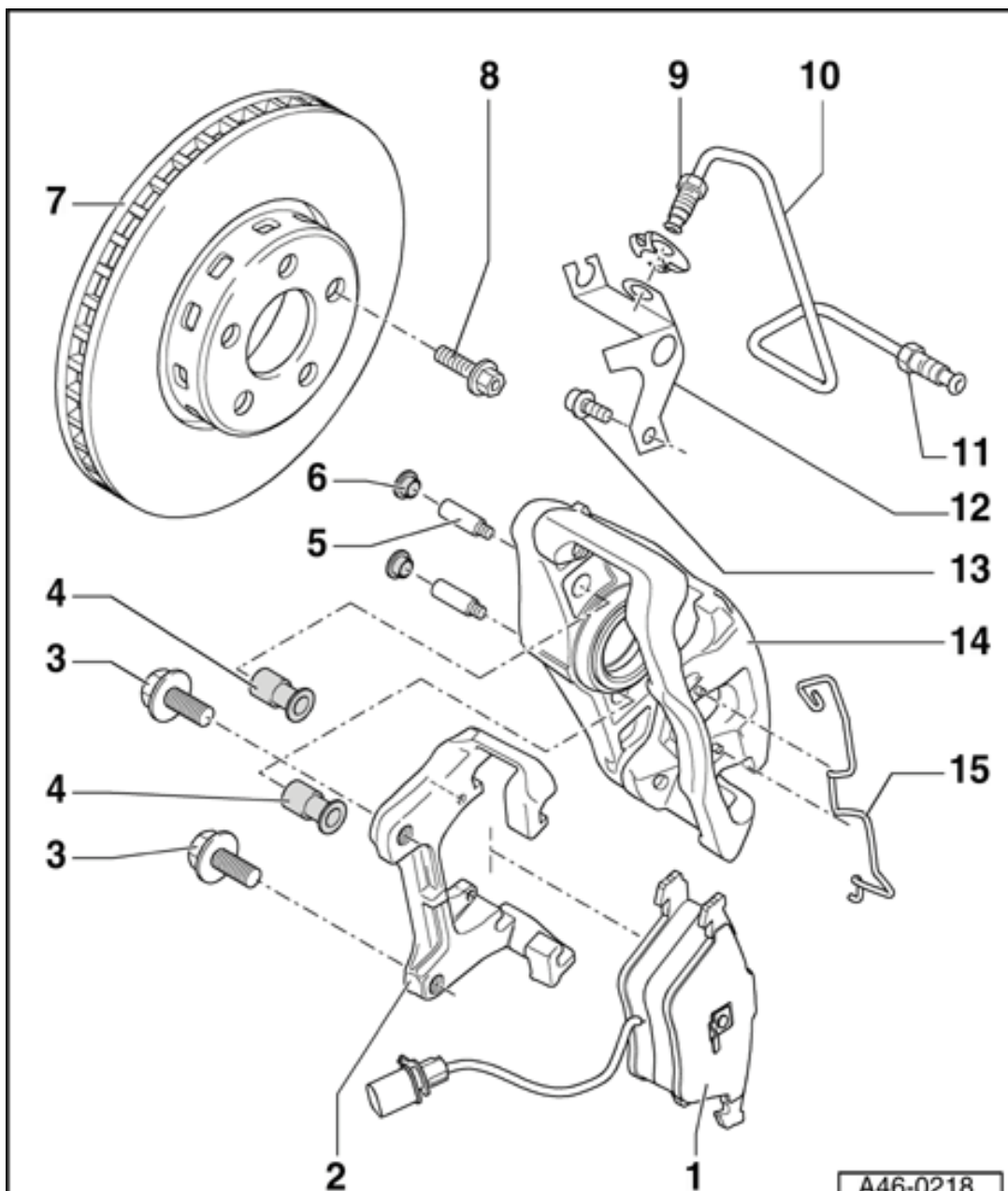
### 1 - Brake pads

#### Note:

The inner pad (with spring) has a cable for wear indicator.

- ◆ The outer brake pads are provided with an adhesive sheet on the backing plate of pad. Remove the protective sheet before inserting pads.





A46-0218

- ◆ Different versions see Parts Catalog
- ◆ If worn, always replace on both sides of the car
- ◆ Removing and installing ⇒ [Page 46-7](#)

**Note:**

*Always clean brake caliper thoroughly before installing new brake pads (must be free of grease). Be especially careful to remove any residual adhesive foil on the surface of the outer brake pads.*

**2 - Brake carrier**

- ◆ Bolt to wheel bearing housing

**3 - Ribbed bolt, 200 Nm**

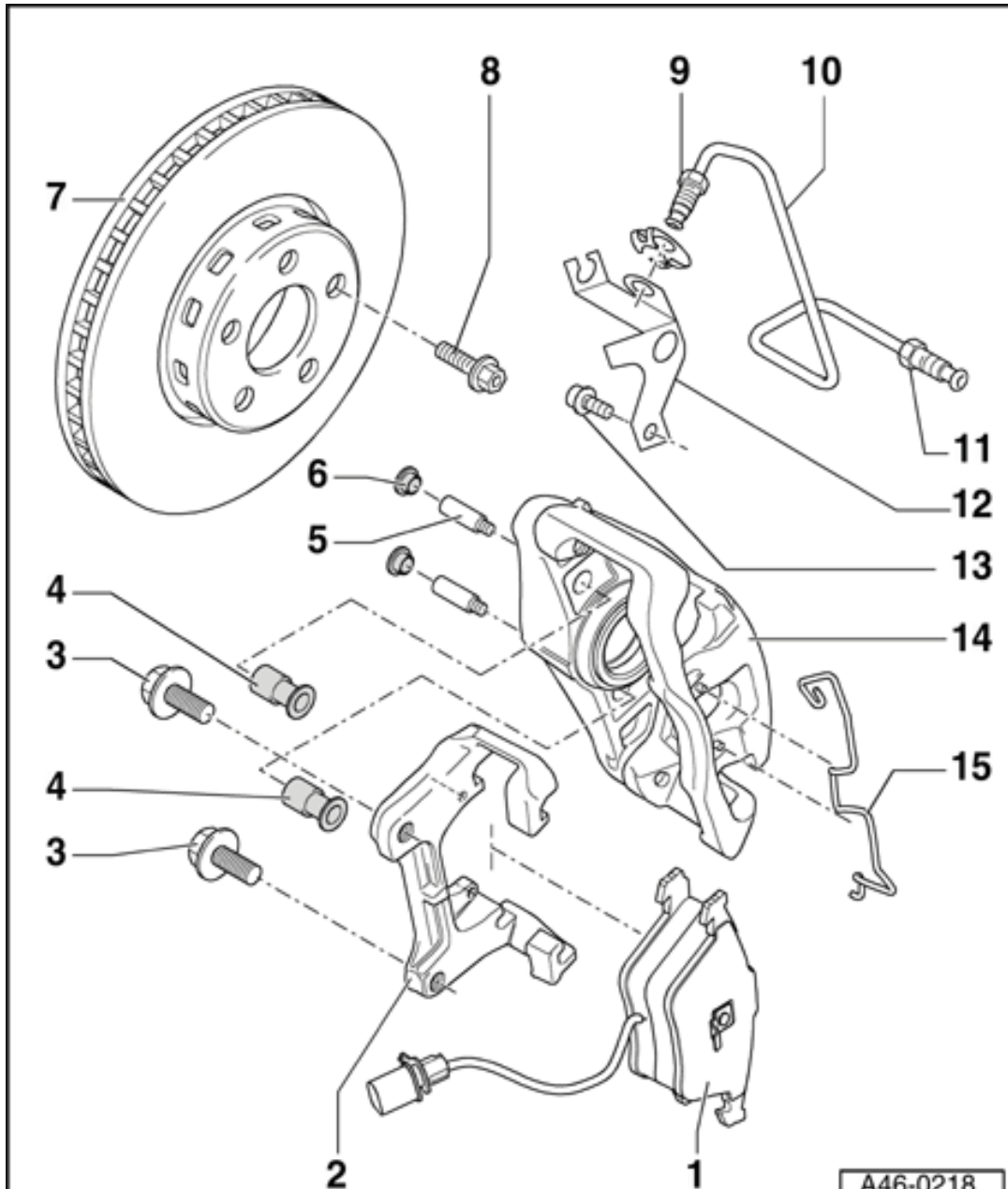
- ◆ Clean ribbing if reusing

2

1

A46-0218

◆ M14 x 1.5 x  
38



#### 4 - Bushing

- ◆ Insert into brake caliper housing

#### 5 - Guide pin, 30 Nm

#### 6 - Trim cap

- ◆ Remove
- ◆ Attach cable for wear indicator

#### 7 - Brake disc

- ◆ If worn, always replace on both sides of the car
- ◆ Remove brake caliper prior to removing
- ◆ Lubricate contact surfaces between brake disc and wheel hub with polyurea grease G 052 142 A2.

⇒ [Repair Manual, Brake System, Repair Group 00; Technical data](#)

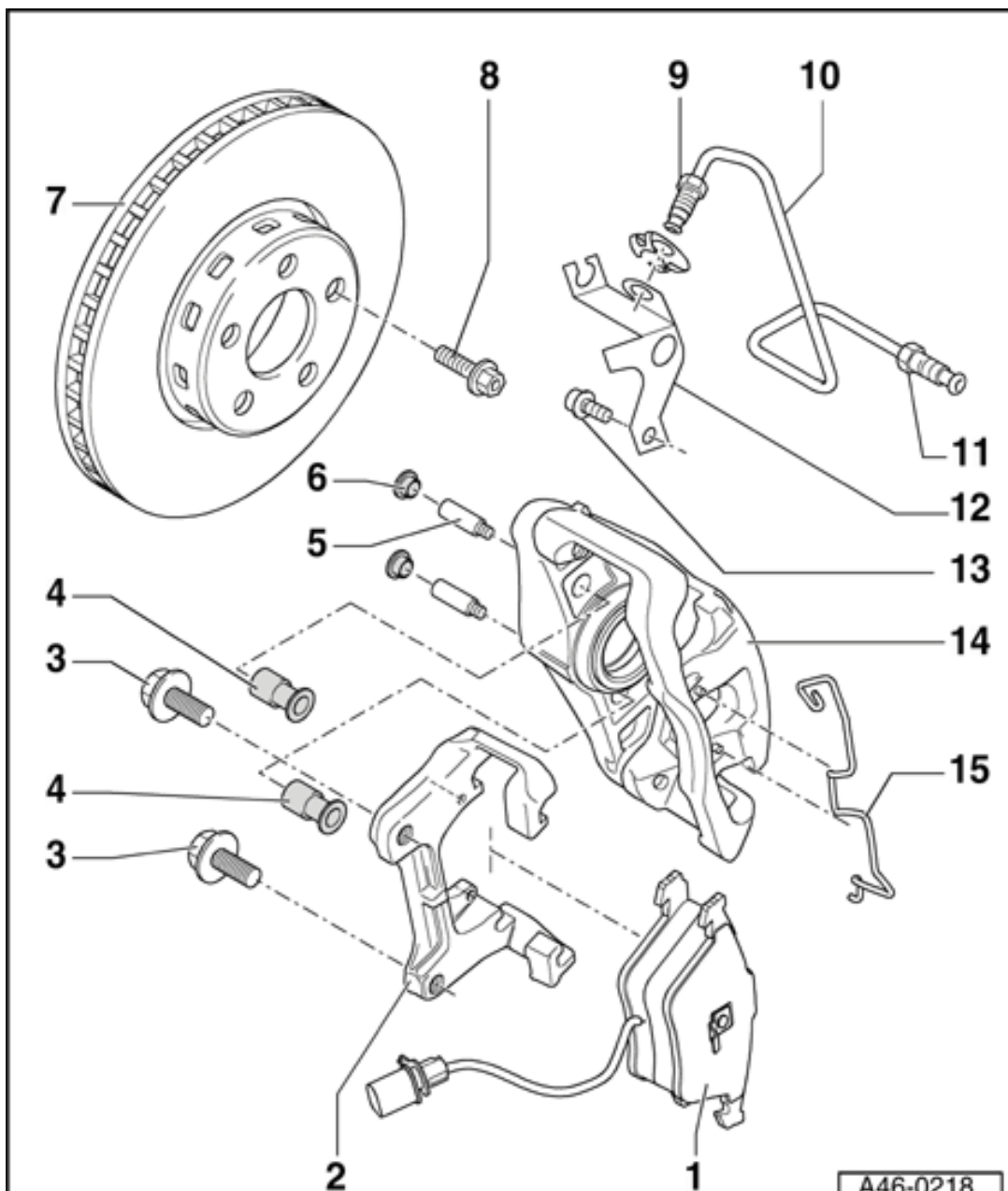
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## 8 - Wheel bolts

- ◆ Tightening torque  
120 Nm



**9 - Brake line connection to brake hose, 15 Nm**

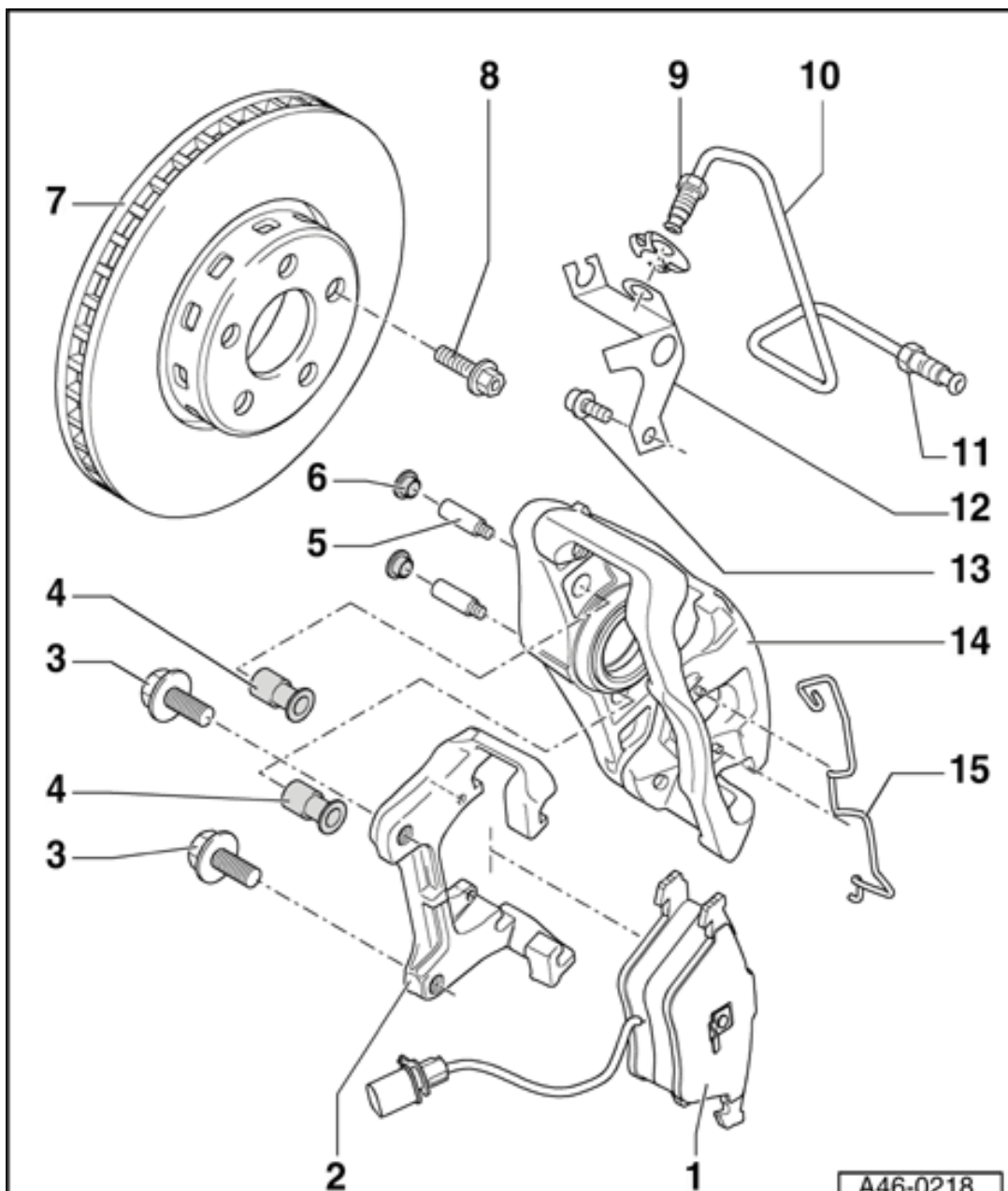
**10 - Brake line**

- ◆ Install in brake caliper housing
- ◆ Attach to brake hose, counter hold on brake hose hex when attaching
- ◆ Hose must be attached without twisting
- ◆ Make sure tabs are properly seated in retainer grooves

**11 - Brake line connection to brake caliper, 17 Nm**

**12 - Bracket**

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



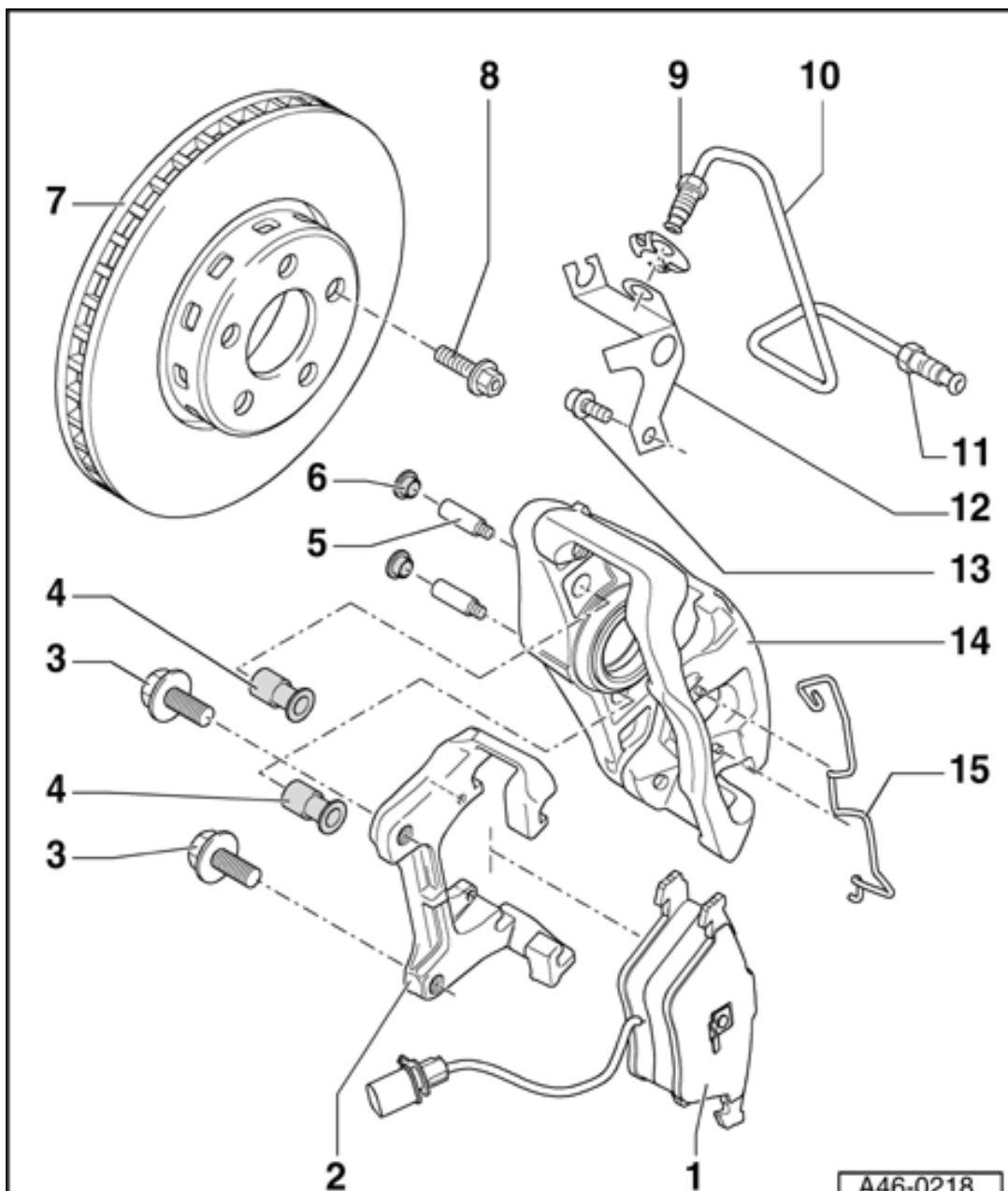
**13 - Hex bolt M8 x 16**

- ◆ Tightening torque  
25 Nm

**14 - Brake caliper housing**

- ◆ If repair work is necessary, do not hang by brake hose. Secure to vehicle using wire
- ◆ Aside from "Replacing brake pads" ⇒ [Page 46-17](#) and "Front brake caliper, servicing" ⇒ [Page 46-24](#), no other repairs may be performed to the brake caliper
- ◆ Hose must be attached without twisting

⇒ [Repair Manual, Brake System, Repair Group 00; Technical data](#)



### 15 - Retaining spring

- ◆ Pay attention to correct installation position.
- ◆ Engage retaining spring on both studs of brake caliper housing and on the outer pad.

#### **Note:**

*Retaining spring must be pressed under brake carrier after it is inserted in both holes. If the spring is improperly installed, the brake caliper cannot adjust to compensate for wear on the outer brake pad. This will cause the brake pedal travel to increase.*



## Brake pads, removing and installing

### Removing

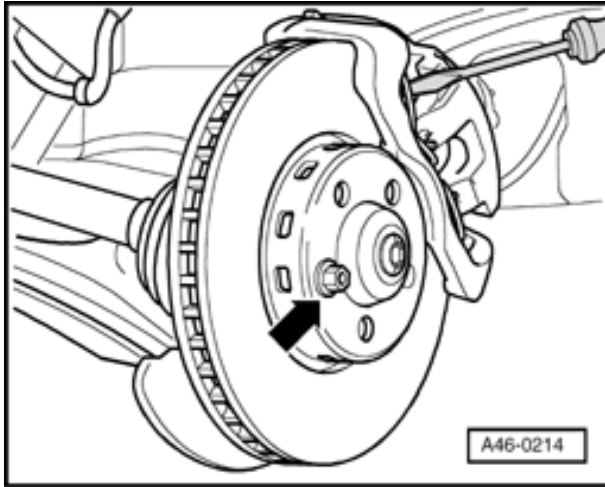
**Note:**

*Mark brake pads to be reused on removal. Reinstall in their original position to prevent uneven braking!*

*Note direction of rotation -arrow on brake disc- and installation location -left or right- when installing brake discs.*

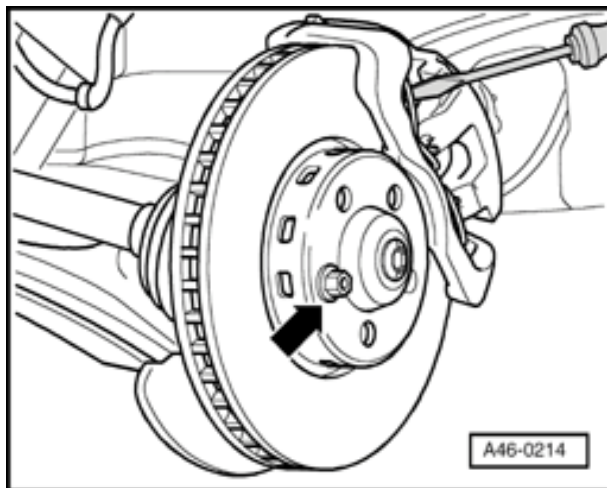
- Raise vehicle.
- Remove wheels.





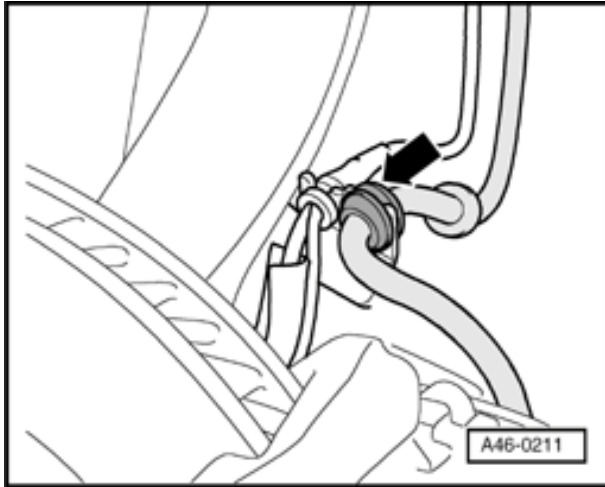
- Secure brake disc with a wheel bolt, see (arrow).

46-18

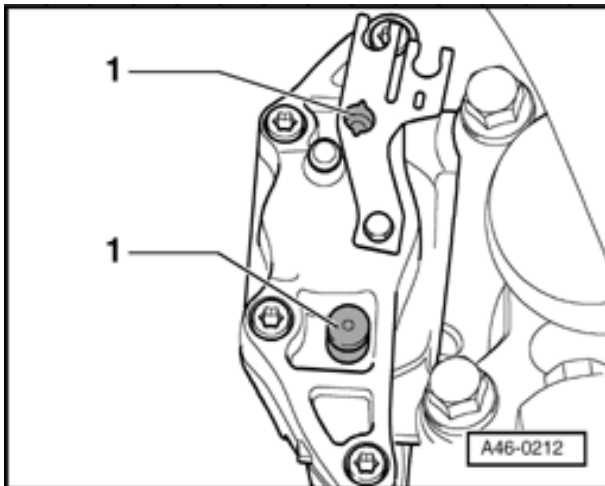


- Using screwdriver, pry off brake pad retaining spring from brake caliper housing and remove.
- Disconnect brake wear indicator connector
- Using a screwdriver, release connector from holder turning connector by 90° at same time.
- Detach connector out upward and unhook wire.

46-19

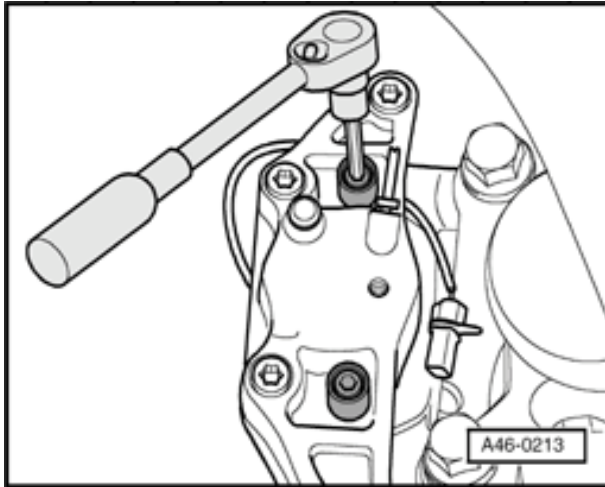


- ◀ - Detach brake line from bracket



- ◀ - Remove trim caps - 1-

46-20

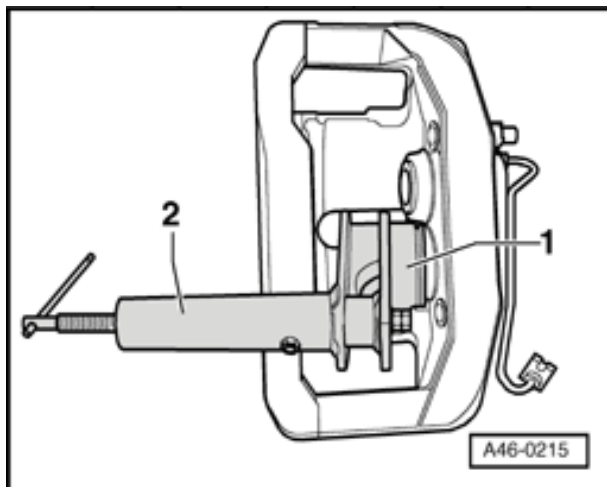


- Unscrew both guide pins and remove from brake caliper.
- Remove brake caliper housing and lay to one side so that the weight of the brake caliper does not stress or damage the brake hose.
- Take brake pads out of brake caliper housing or from brake carrier.

**Use only methylated spirits to clean brake caliper housing.**



## Installing



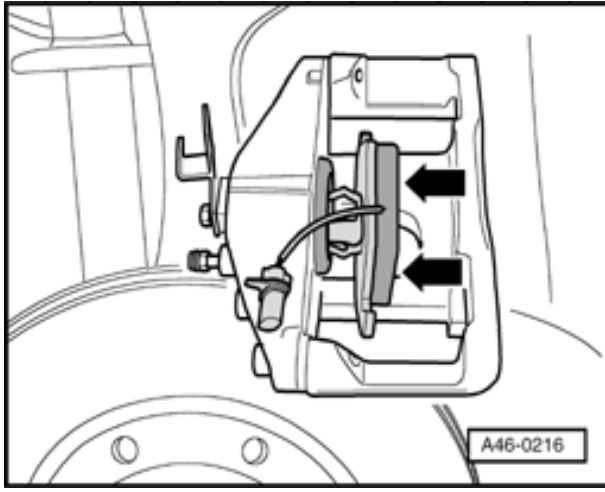
- ◀ - Press back piston.

### **Note:**

*Press piston back into caliper housing using resetting tool before inserting new brake pads. Before pushing back the piston, draw off brake fluid out of the brake fluid reservoir with a bleeder bottle. Otherwise, especially if reservoir has been topped off, fluid will overflow and cause damage.*

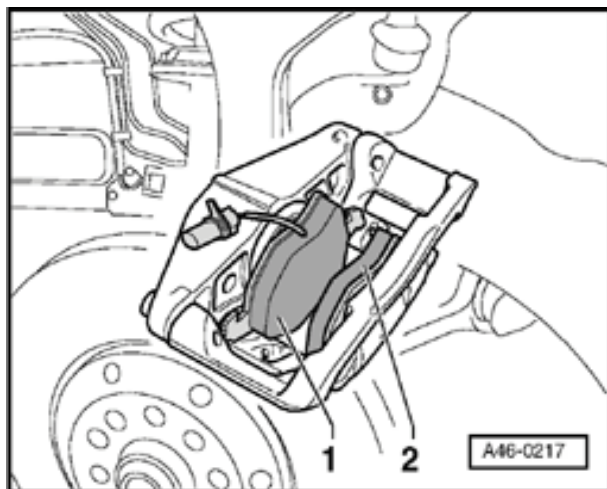
### **WARNING!**

***Brake fluid is poisonous and must not be siphoned by mouth through a hose.***



- Insert brake pad with retaining spring and wear indicator into brake caliper housing.

46-22



- ◀ - Install outer brake pad -2- onto brake caliper.

**Note:**

*Insert pads in brake carrier and install together on brake caliper and brake disc.*

- Secure brake carrier to brake caliper housing with both guide pins to 25 Nm.
- Make sure brake hose is installed without twisting.

46-23



- Install both protective caps.
  
- Insert retaining spring into brake caliper housing.
  
- Attach brake line
  
- Plug in connector for wear indicator and engage line in dust cap and trim cap.
  
- Install wheels

Tightening torque 120 Nm

**Note:**



- ◆ *Retaining spring must be pressed under brake carrier after it is inserted in both holes. If the spring is improperly installed, the brake caliper cannot adjust to compensate for wear on the outer brake pad. This will cause the brake pedal travel to increase.*
  
  - ◆ *After installing brake pads and before moving vehicle, depress brake pedal several times firmly to properly seat brake pads in their normal operating position.*
- Check brake fluid level and top off, if necessary.



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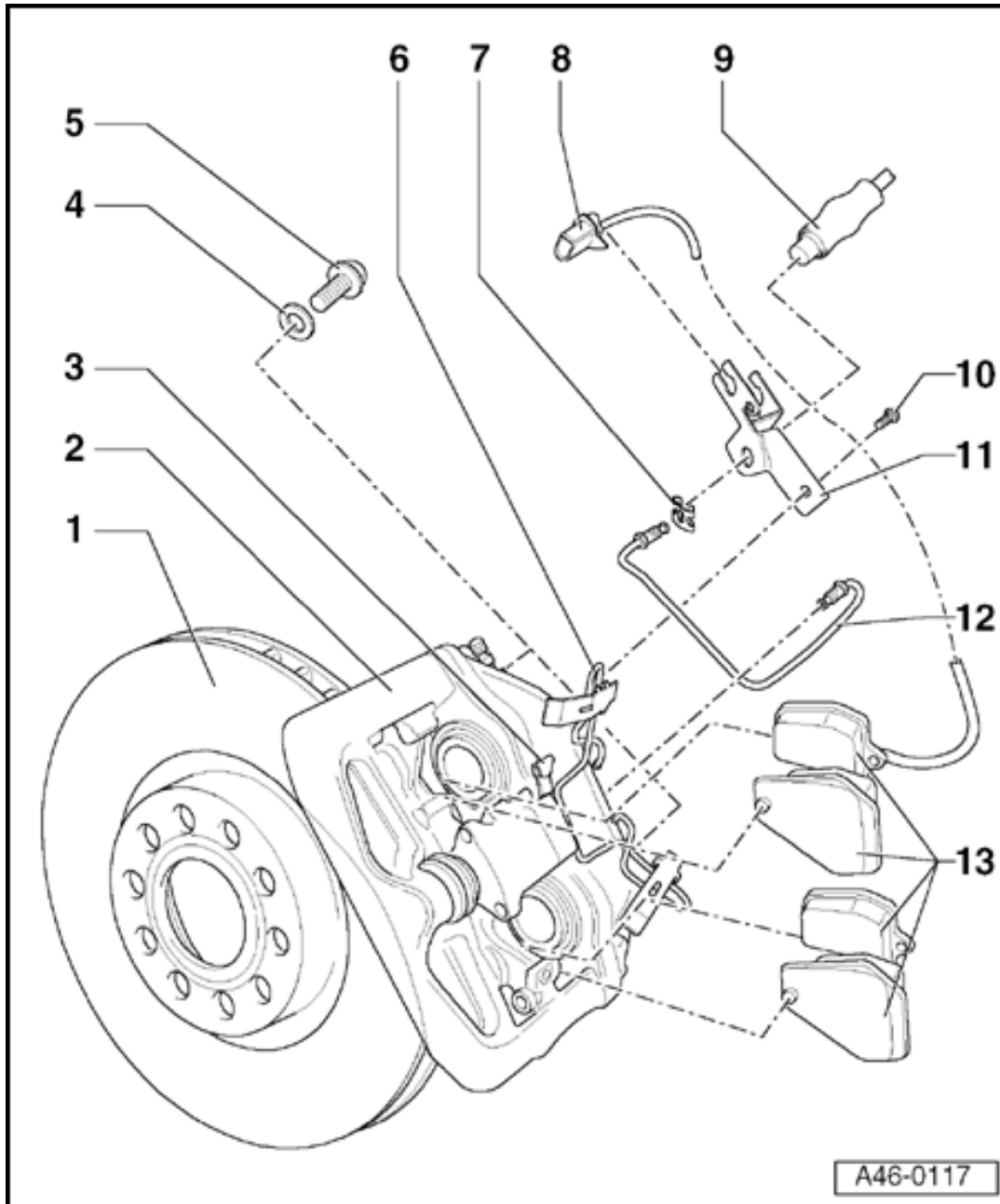
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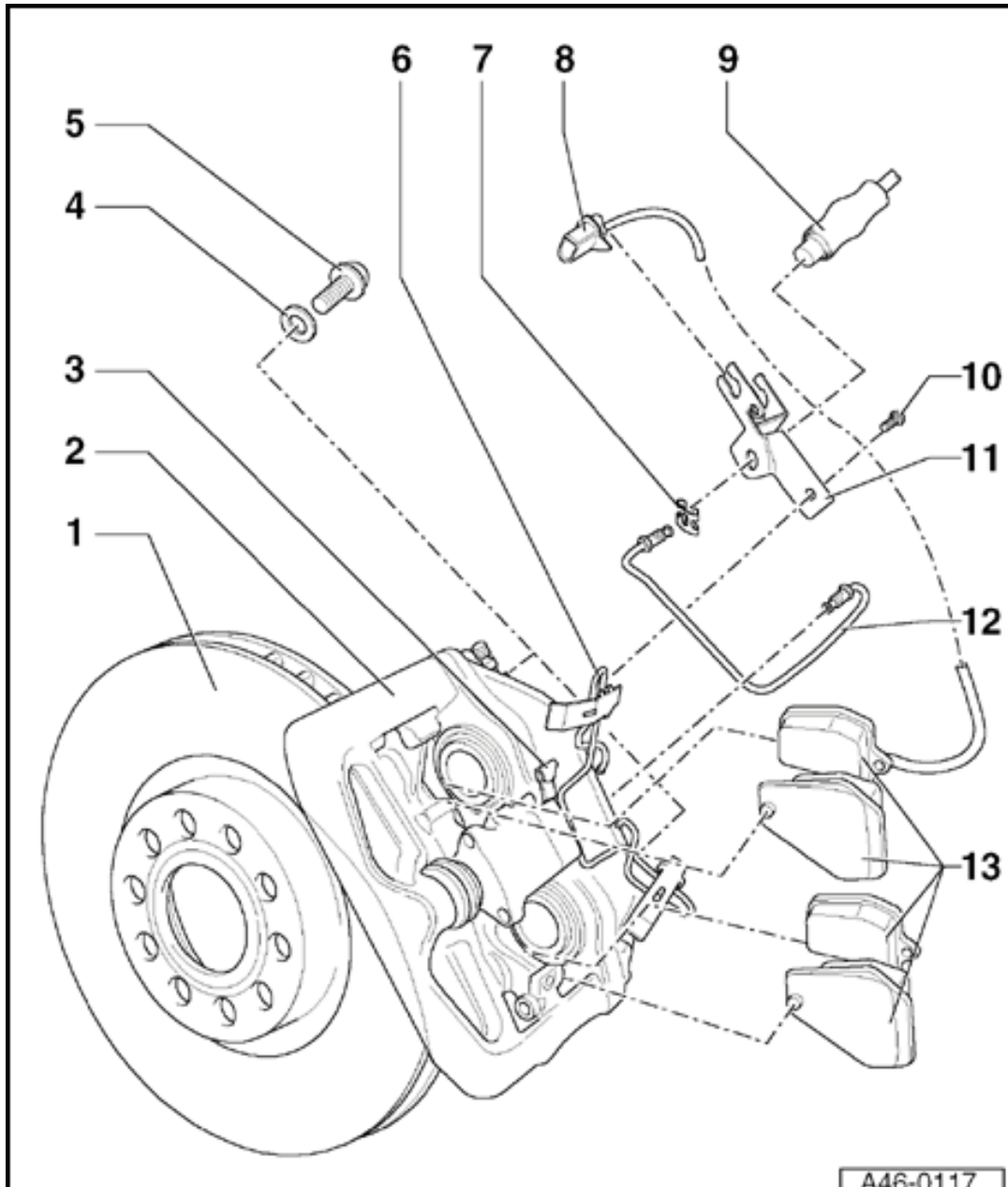


## Front brakes (HP-2) brake caliper/ aluminum

### Front brake caliper, servicing

#### Note:

- ◆ Always install complete repair kit.
- ◆ After replacing brake pads and before moving vehicle, depress brake pedal several times firmly to properly seat brake pads in their normal operating position.
- ◆ When siphoning brake fluid, always use a bleeder bottle that is used exclusively for brake fluid. Brake fluid is poisonous. NEVER siphon brake fluid with your mouth!
- ◆ Brake line tightening torque: 15 Nm.



### 1 - Brake disc

- ◆ Both sets of brake pads on front axle must always be replaced together
- ◆ Check for sufficient wear limit
- ◆ Remove brake caliper before removing

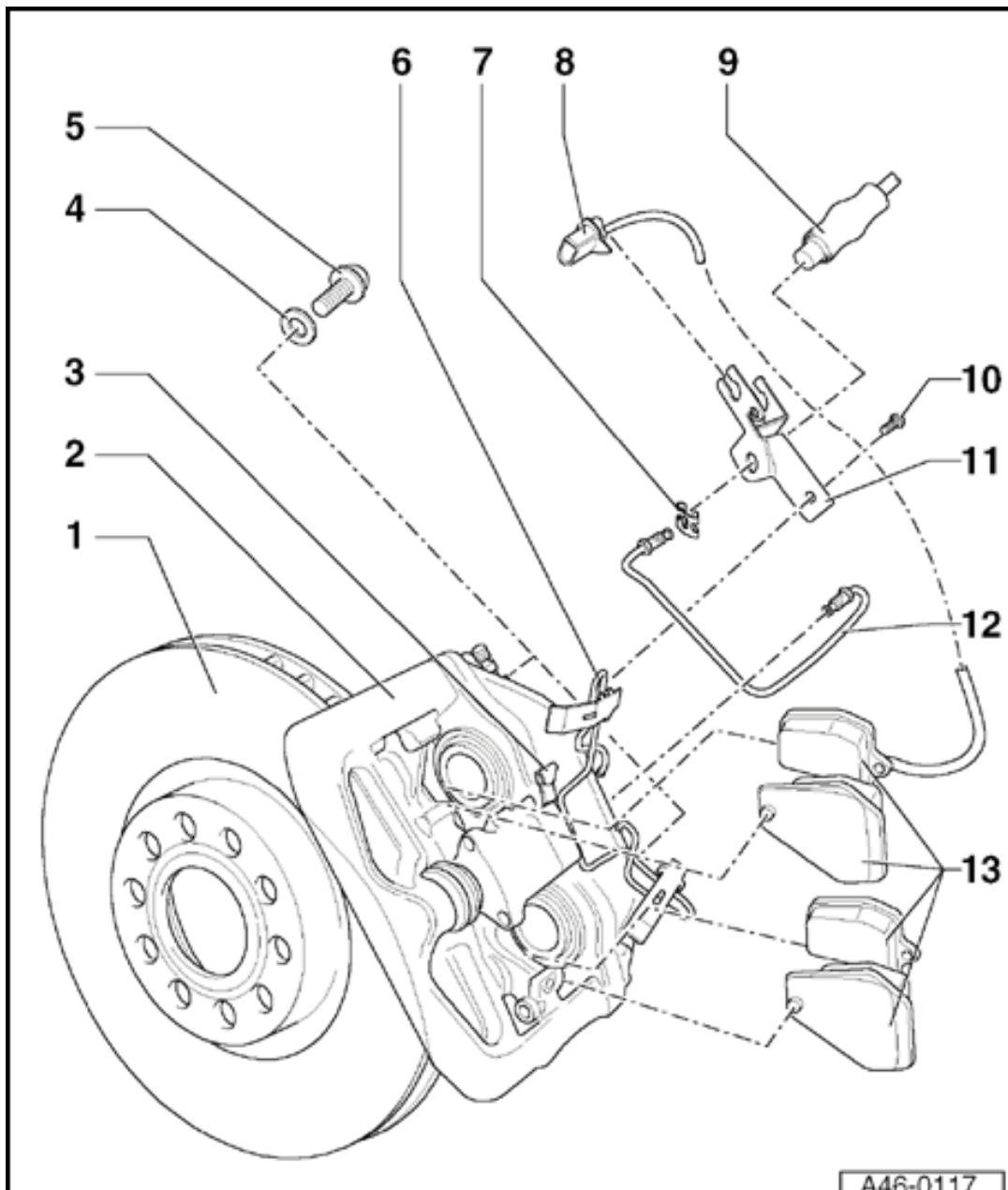
⇒ [Repair Manual, Brake System, Repair Group 00; Technical data](#)

### 2 - Brake caliper

- ◆ If repair work is necessary, do not hang by brake hose. Secure to vehicle using wire

A46-0117

- ◆ Aside from "Replacing brake pads" ⇒ [Page 46-29](#) and "Front brake caliper, servicing" ⇒ [Page 47-16](#) , no other repairs may be performed to brake caliper



**3 - Line retainer for wear indicator**

- ◆ Insert line for brake pad wear indicator in line retainer

**4 - Ribbed washer**

**5 - Ribbed bolt, 190 Nm**

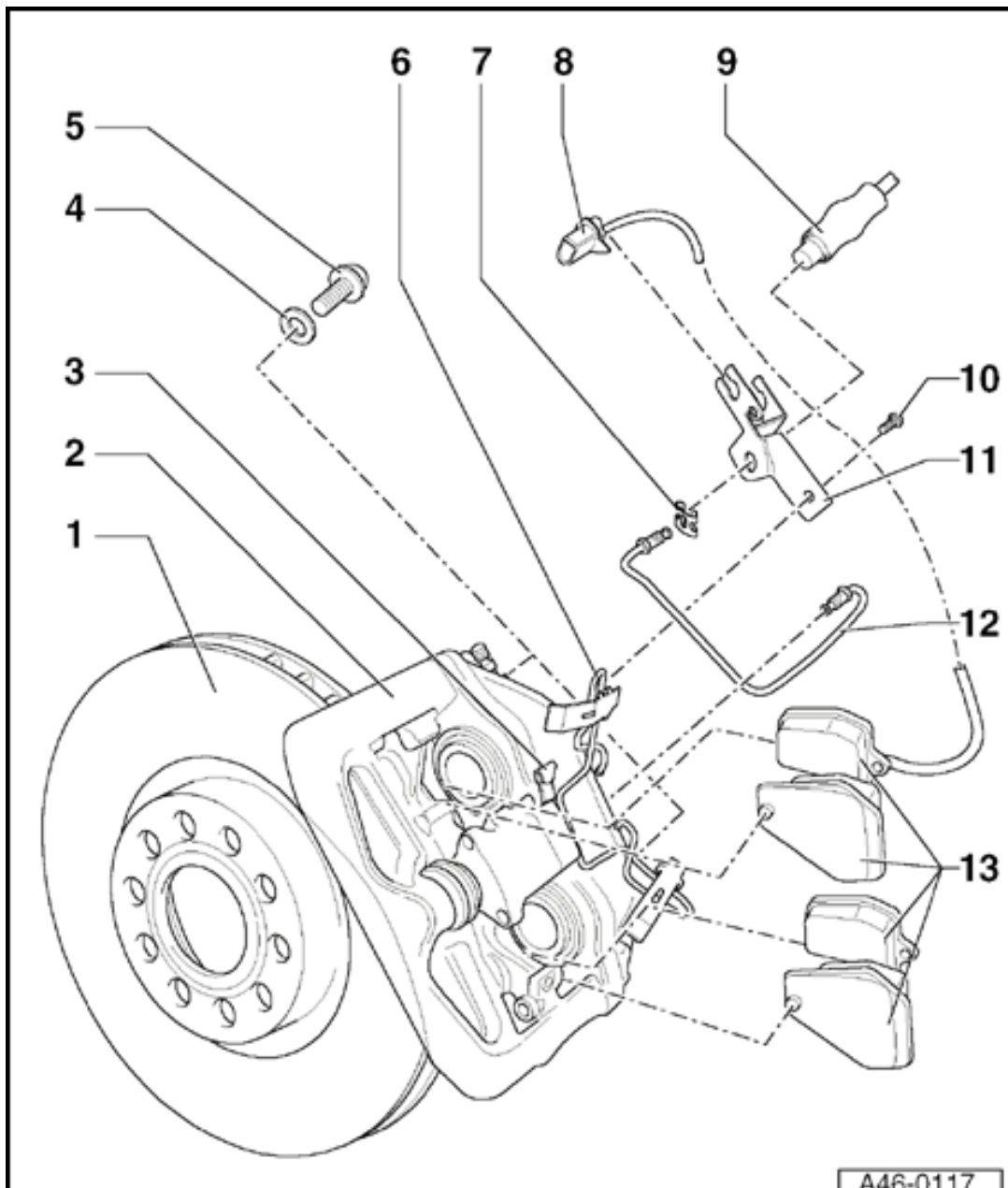
- ◆ Clean ribs if re-using

**6 - Tensioning spring**

- ◆ Slide to side
- ◆ Not removable

**7 - Retaining spring**

A46-0117



**8 - Harness connector**

- ◆ Only on vehicles with wear indicator

**9 - Brake hose**

- ◆ Do not disconnect when removing brake pads

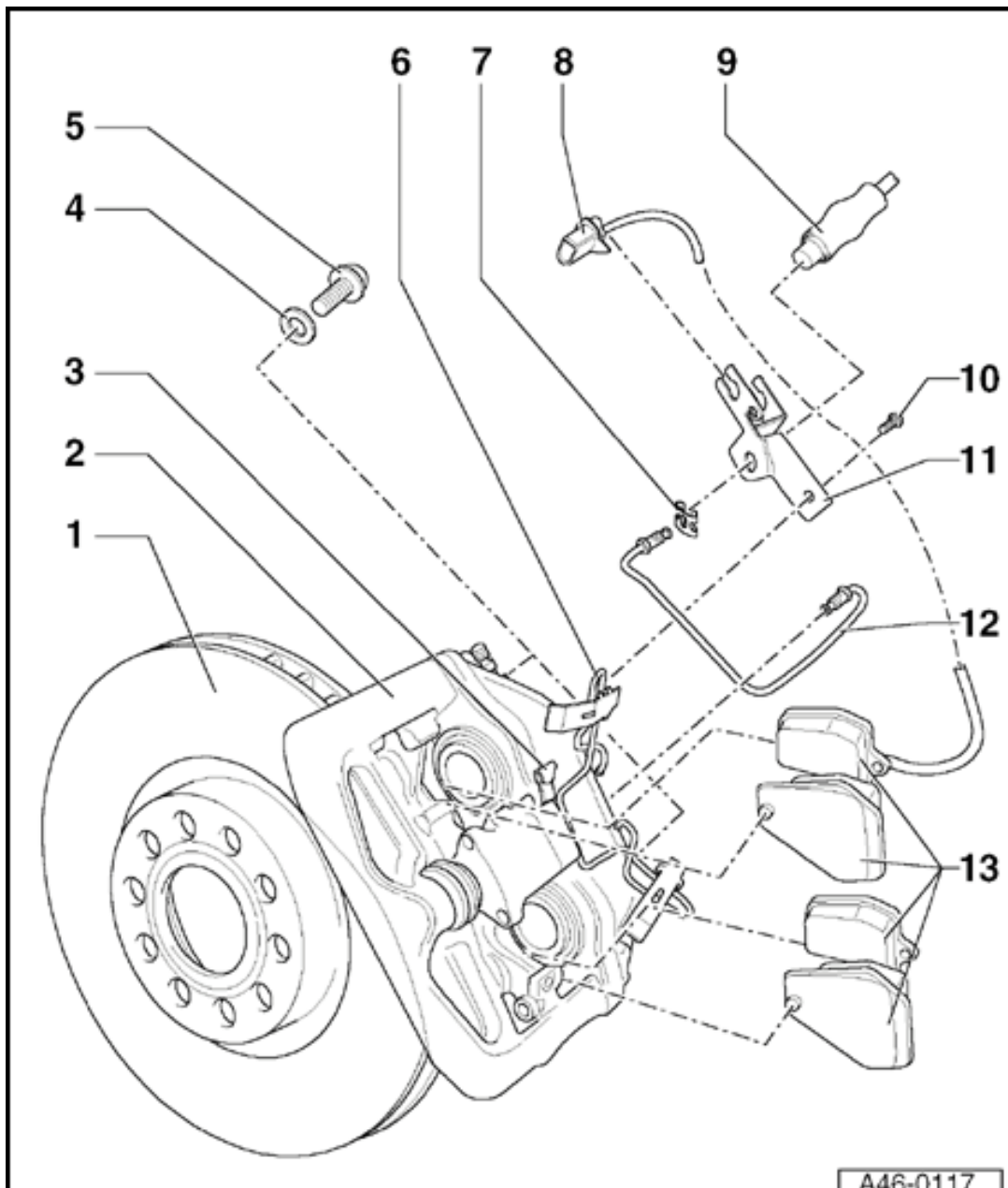
**10 - Hex bolt, 25 Nm**

**11 - Bracket**

- ◆ Bolt to brake caliper housing
- ◆ Insert harness connector for brake pad wear indicator

A46-0117





A46-0117

**12 - Brake line, 15 Nm**

**13 - Brake pads**

- ◆ Both sets of brake pads on front axle must always be replaced together
- ◆ Different on left and right sides
- ◆ Removing and installing ⇒ [Page 46-29](#)
- ◆ With wear indicator
  - Once wear limit is reached (limit: 3 mm), warning light in instrument cluster comes on.
- ◆ Remove adhesive foil from backing plates on outer brake pads before installing

⇒ [Repair Manual, Brake System, Repair Group 00;](#)

A46-0117

[Technical data](#)



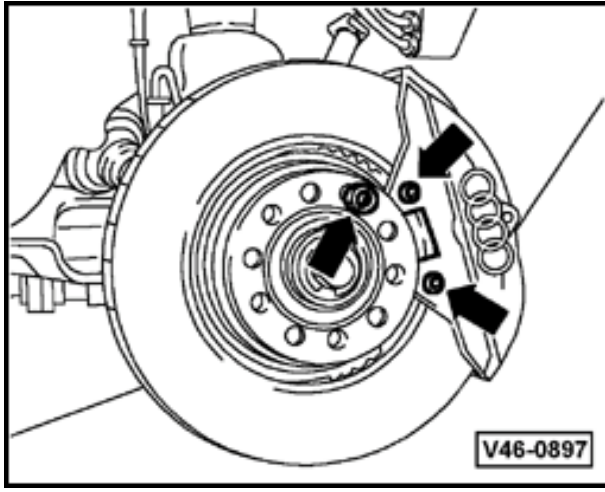
## Brake pads, removing and installing

### Removing

**Note:**

*If re-using brake pads, mark them so that they can be installed in their original positions to prevent uneven braking.*

- Raise vehicle.
- Remove wheels.

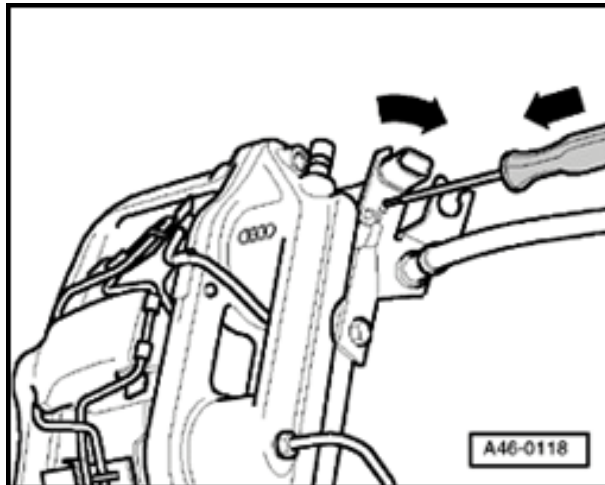


- ▲ - Secure brake disc using a wheel bolt.

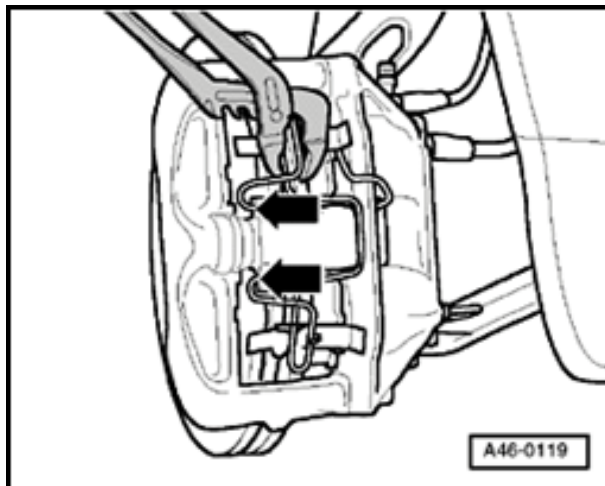
46-30



- Disconnect connector for brake pad wear indicator.



- Disengage connector from bracket using a screwdriver and simultaneously turn connector 90° .
- Lift connector up and out and disengage wire.



- Press upper and lower spring tensioner out of locking mechanism using pliers (arrows).
- Slide spring to side.

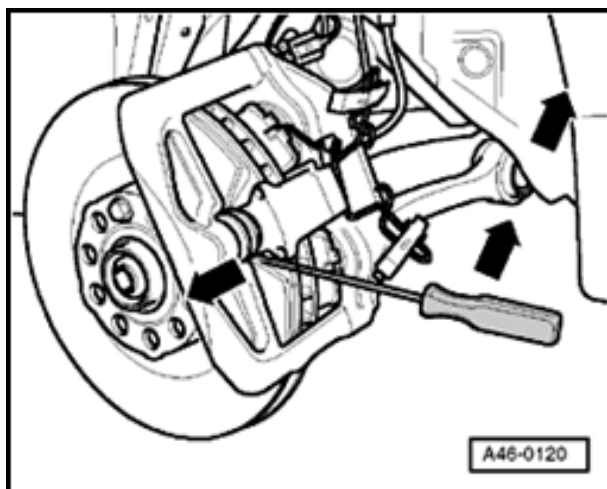


**Note:**

*Before pushing back piston, siphon some of the brake fluid out of the brake fluid reservoir. Otherwise, especially if reservoir has been topped off, fluid will overflow and cause damage.*

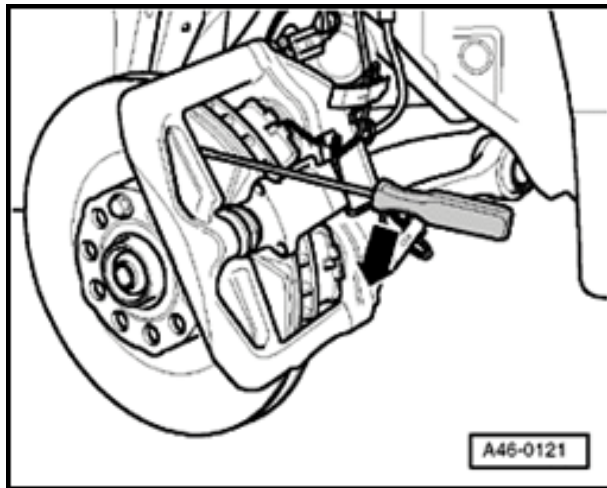
**WARNING!**

***Brake fluid is poisonous. NEVER siphon brake fluid with your mouth.***

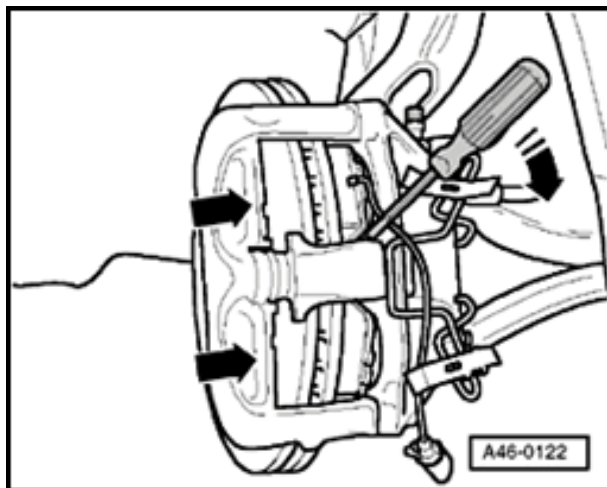


- Press piston back into brake caliper housing.
- To do this, insert floating frame using a screwdriver as shown and press powerfully outward.

46-32



- ▲ - First use screwdriver to press outer brake pads off brake caliper.

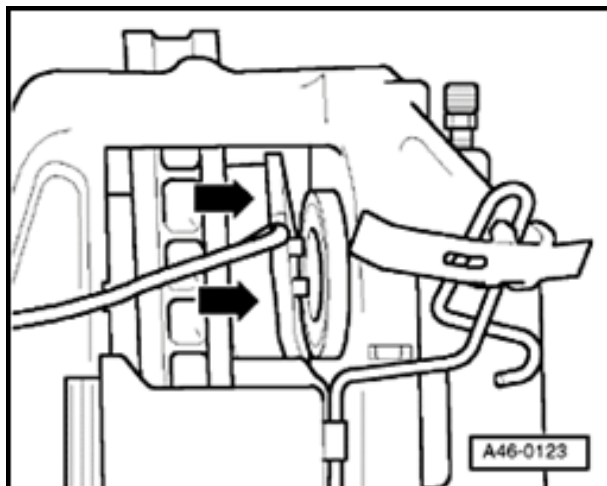


- ⚠ - Press floating frame firmly in direction of (arrow) until stop.
- Pry brake pads carefully out of piston and remove brake caliper housing.

**Note:**

- ◆ Clean brake caliper housing thoroughly before installing new brake pads.
- ◆ Be especially careful to remove any residual adhesive foil on outer brake pads.

**Installing**



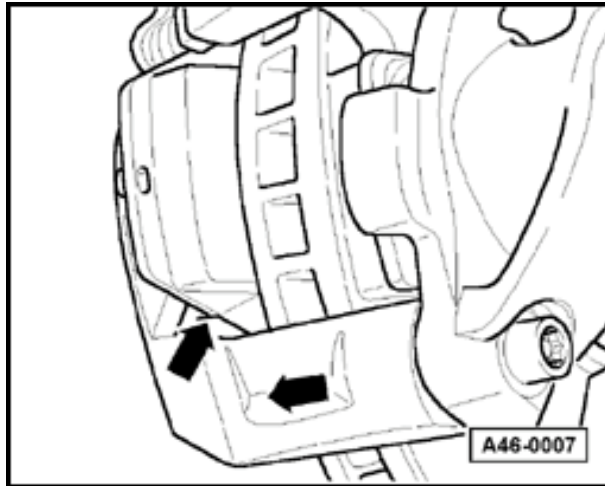
- ⚠ - Insert lower and upper brake pads in piston.

**Note:**

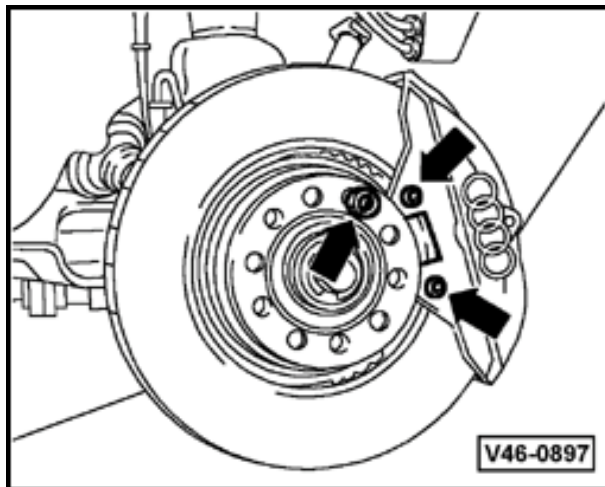
- ◆ Make sure protrusions on backing plates are securely fitted in brake piston.
- ◆ Do not damage protective caps when installing brake pads.



46-34



- ▲ - Press floating frame outward until stop.
- Remove protective foil on backing plates of outer brake pads.



- ▲ - Make sure protrusions on backing plate are securely fitted in floating frame.

**Note:**

*After replacing brake pads and before moving vehicle, always depress brake pedal several times firmly to properly seat brake pads in their normal operating position.*

46-35



- Remove wheel bolt from wheel hub.

**Note:**

*When installing wheels, make sure rim flange does not rest on brake caliper. This could push brake pads out of position.*

- Install wheels

Tightening torque 120 Nm

- Check brake fluid level and top off, if necessary.