



## Work descriptions (part 2 of 2)

### Engine oil level, checking

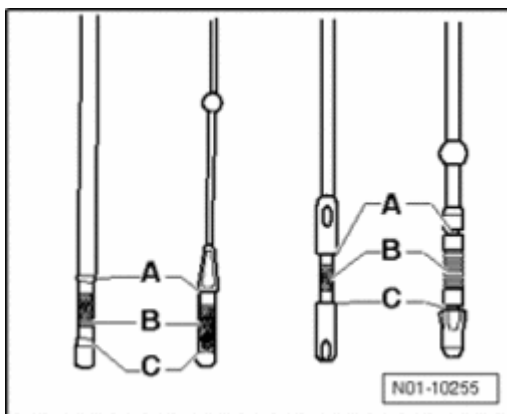
Note the following:

- After stopping engine, wait at least 3 minutes to allow oil to flow back into oil pan.
- Pull out oil dipstick, wipe off with a clean cloth and re-insert dipstick again up to stop.

#### **Note:**

- *Observe disposal regulations!*

- Withdraw dipstick again and read oil level.



On the oil dipstick:

A - Oil must not be topped off.

B - Oil may be topped off. After topping off, oil may be in range A .

C - Oil must be topped off. After topping off, it is sufficient if oil level is somewhere in range B (shaded area).

At an oil level above marking - **A** - , there is a danger of damage to catalytic converter.

- At an oil level below marking - **C** - , fill up with oil up to marking - **A** - . Oil specification ⇒ [01-3, Engine oils](#) .

### Engine oil, draining or siphoning, replacing oil filter and filling up with engine oil

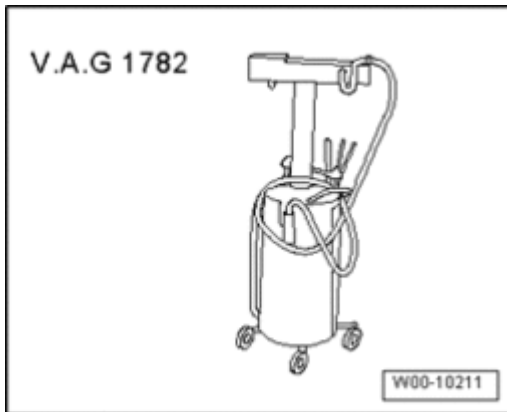
Engine oil: Drain or extract and fill; replace oil filter, ⇒ [01-5, Draining or extracting engine oil](#) .

Replacing oil filter, ⇒ [01-5, Oil filter, replacing](#) .

Filling with engine oil, ⇒ [01-5, Filling with engine oil](#)

### Draining or extracting engine oil

#### Special tools, testers and auxiliary items required



- Oil collecting and extracting device V.A.G 1782
- Oil absorbing cloth VAS 6204/1

### Draining or extracting engine oil

Perform the following work procedure:

#### Note:

- *On engines with standing oil filter module, the oil filter should be replaced before changing engine oil ⇒ [01-5, Oil filter, replacing](#) . Removing the filter element will open a valve and oil in the filter housing will flow automatically into the crankshaft housing.*
- *If engine oil is drained and is not extracted using oil extracting device, replace oil drain plug. This will prevent leaks.*

- Extract engine oil using oil collecting and extracting device V.A.G 1782 .

or

- Remove oil drain plug.

#### Note:

- *Observe disposal regulations!*

- *Oil drain plug has a permanent sealing ring, therefore oil drain plug must always be replaced.*

- Drain engine oil.

- Hand-tighten new oil drain plug and tighten to specified tightening torque.

- Fill up with engine oil, specifications ⇒ [01-3, Engine oils](#) .

Engine oil capacity,

⇒ *Repair Manual, Engine Mechanical, Repair Group 17,*

.

#### **Tightening torques of oil drain plug:**

- Gasoline engines 30 Nm
- Diesel engines 30 Nm

#### ***Warning!***

- ***Torque specifications must not be exceeded.***
- ***A higher torque can lead to leaks in the area of the drain plug or even to damage.***

#### **Oil filter, replacing**

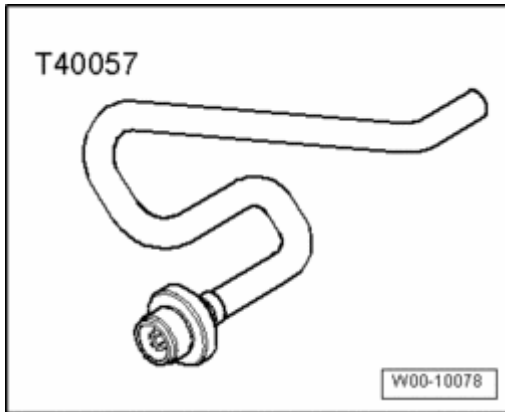
Replacing oil filter, 2.0 L TFSI engine, ⇒ [01-5, Replacing oil filter, 2.0 L TFSI engine](#) .

Replacing oil filter, 2.5 L fuel injected engine, ⇒ [01-5, Replacing oil filter, 2.5 L fuel injected engine](#) .

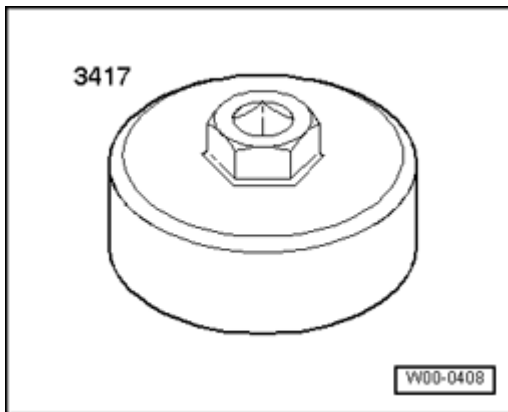
Replacing oil filter, diesel engine, ⇒ [01-5, Replacing oil filter, diesel engine](#) .

#### **Replacing oil filter, 2.0 L TFSI engine**

#### **Special tools, testers and auxiliary items required**

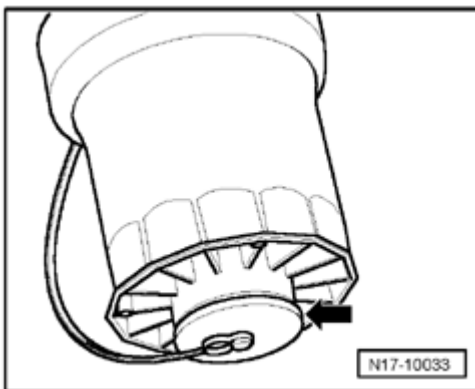


- Oil Drain Adapter T40057



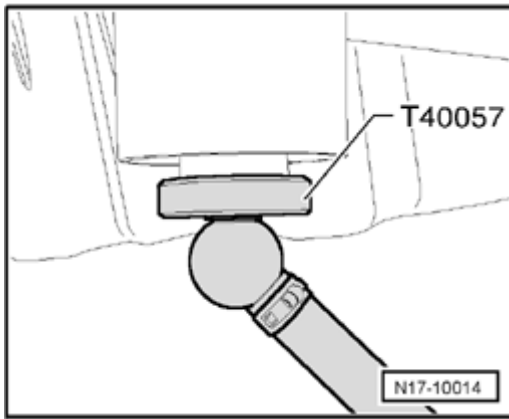
- Oil Filter Wrench 3417
- Torque Wrench 5-50Nm VAG1331

**Perform the following work procedure:**



- Remove dust cap - **arrow** - from oil filter housing.

Before oil filter housing is removed, it must be emptied.

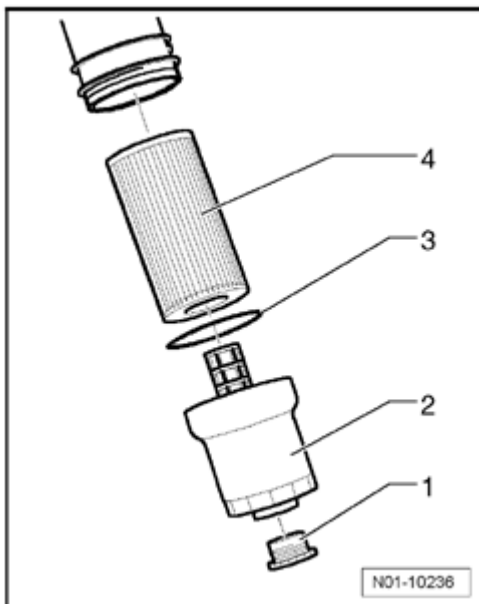


- Thread Oil Drain Adapter T40057 into oil filter housing and hold hose into oil drain pan.

**Note:**

- *While threading in Oil Drain Adapter T40057, a valve in the oil filter housing is opened. If the Oil Drain Adapter T40057 is removed, the valve closes again automatically.*

- Drain engine oil.
- Remove Oil Drain Adapter T40057 .
- Oil filter housing may now be removed using Oil Filter Wrench 3417 .



- Replace oil filter element - 4 - and sealing ring - 3 - .

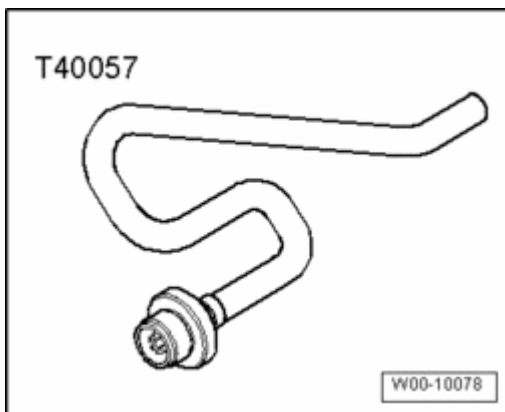
**Note:**

- *Observe disposal regulations!*

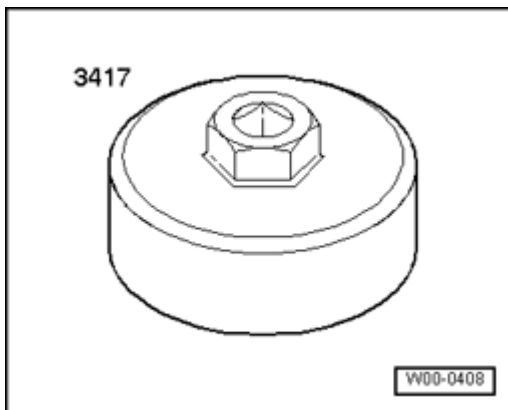
- Tighten oil filter housing - 2 - to 25 Nm.
- Hand-tighten dust cap - 1 - to oil filter housing - 2 - .

### Replacing oil filter, 2.5 L fuel injected engine

#### Special tools, testers and auxiliary items required

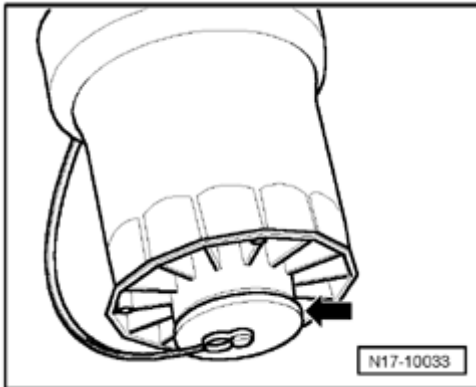


- Oil Drain Adapter T40057



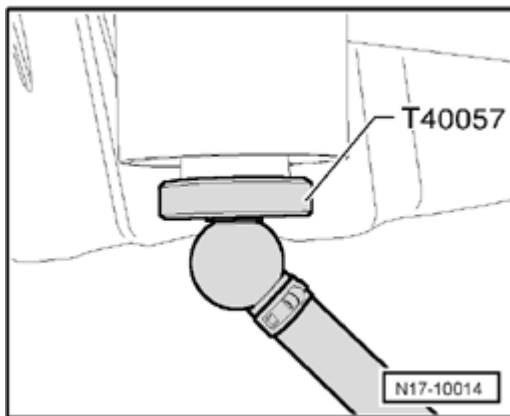
- Oil Filter Wrench 3417
- Torque Wrench 5-50Nm VAG1331

**Perform the following work procedure:**



- Remove dust cap - **arrow** - from oil filter housing.

Before oil filter housing is removed, it must be emptied.



- Thread Oil Drain Adapter T40057 into oil filter housing and hold hose into oil drain pan.

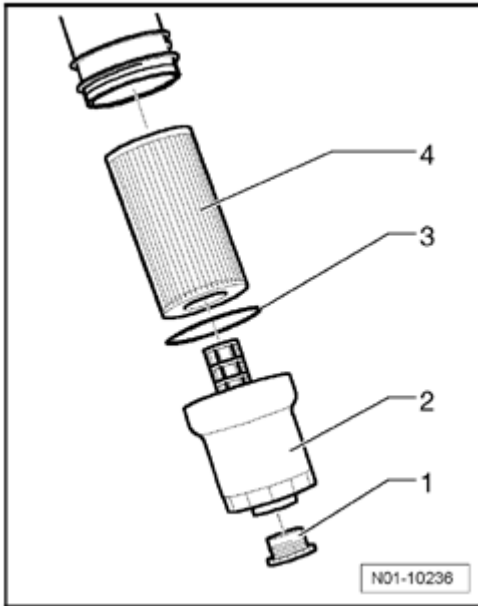
**Note:**

- *While threading in Oil Drain Adapter T40057 , a valve in the oil filter housing is opened. If the Oil Drain Adapter T40057 is removed, the valve closes again automatically.*

- Drain engine oil.

- Remove Oil Drain Adapter T40057 .

- Oil filter housing may now be removed using Oil Filter Wrench 3417 .



- Replace oil filter element - **4** - and sealing ring - **3** - .

**Note:**

- *Observe disposal regulations!*

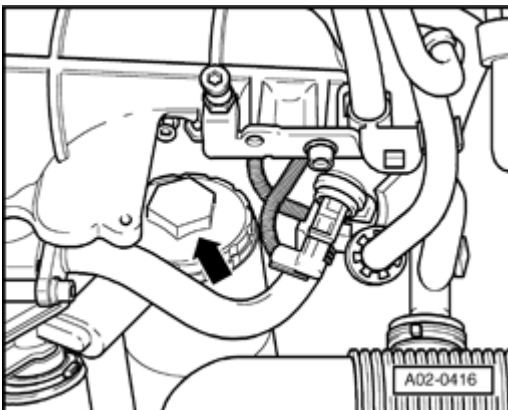
- Tighten oil filter housing - **2** - to 25 Nm.
- Hand-tighten dust cap - **1** - to oil filter housing - **2** - .

**Replacing oil filter, diesel engine**

**Removing**

**Note:**

- *Observe disposal regulations!*
- *Coat new O-rings with oil before installing.*



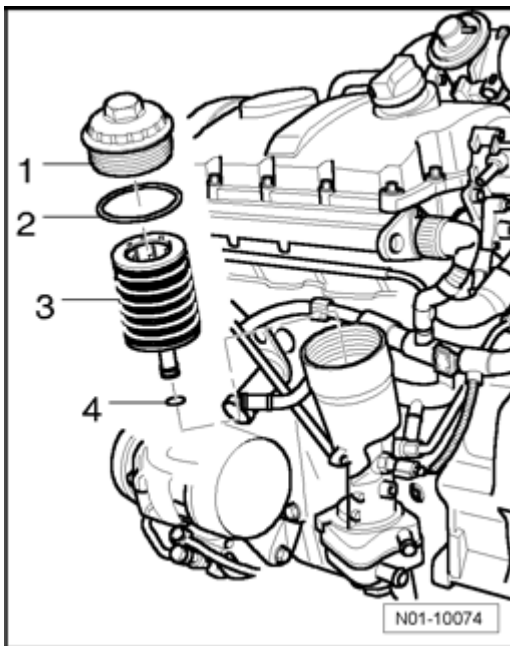
Loosen cap - **arrow** - e.g. using 36 mm open end wrench or 36 mm socket T10125 .

**Note:**

- *Loosen cap before draining/extracting so that engine oil can flow out of filter housing.*

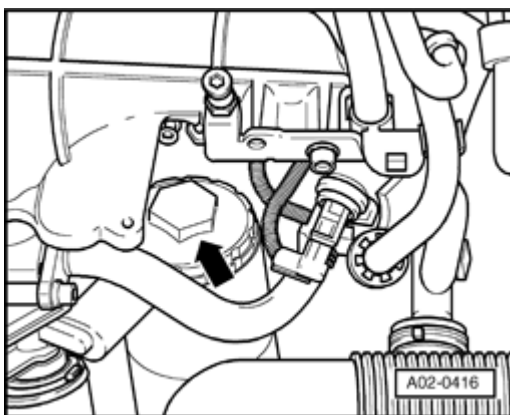
- Clean sealing surfaces on screw cap and on oil filter housing.

**Installing**



- Replace oil filter element - **3** - .

- Replace O-ring - **2 and 4** - .



- Install screw cap arrow and tighten to 25 Nm.

The rest of the installation follows the reverse of the removal procedures.

## Filling with engine oil

Oil specifications, see page ⇒ [01-3, Engine oils](#)

Oil filling quantity,

⇒ *Repair Manual, Engine Mechanical, Repair Group 17,*

*, Lubrication system components, removing and installing*

## General notes

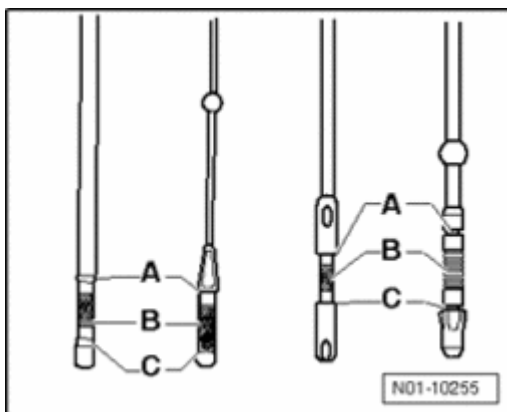
### Note:

- *Observe disposal regulations!*

- After topping up with oil, wait at least 3 minutes, then check oil level.

- Pull out oil dipstick, wipe off with a clean cloth and re-insert dipstick again up to stop.

- Withdraw dipstick again and read oil level.



On the oil dipstick:

A - Oil must not be topped off.

B - Oil may be topped off. After topping off, oil may be in range A .

C - Oil must be topped off. After topping off, it is sufficient if oil level is somewhere in range B (shaded area).

At an oil level above marking - **A** - , there is a danger of damage to catalytic converter.

- At an oil level below marking - **C** - , fill up with oil up to marking - **A** - . Oil specification ⇒ [01-3, Engine oils](#) .

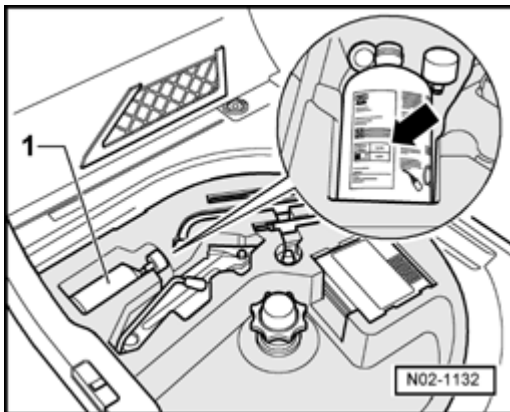
## Break-down set, checking

### Note:

- *Break-down set is located in spare wheel well.*
- *Break-down set contains, among other things, a tire inflation bottle with tire sealant.*

## Expiration date, checking

- Check expiration date.



Shelf-life date is located on a sticker on tire sealant - **arrow** - .

- Replace tire sealant if expiration date has been reached. (tire sealant must not be older than 4 years).

### Note:

- *If tire sealant was already used once, it must be replaced.*
- *Observe disposal regulations.*

## Road test, performing

To what extent the following can be checked is dependent upon the vehicle equipment and local conditions (urban/country).

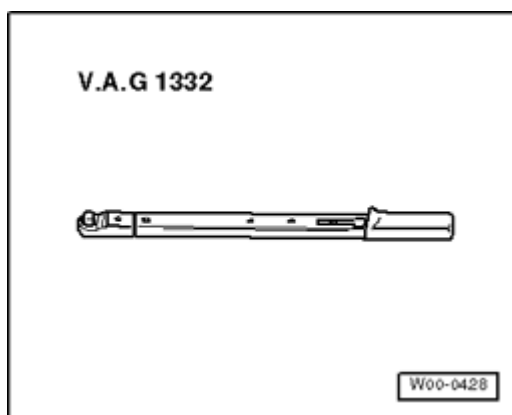
The following should be checked by means of a road test:

- Engine: Output, misfiring, idling speed, acceleration
- Clutch: Pulling away, pedal pressure, odors
- Gear selection: Ease of operation, shift lever position

- Automatic transmission: Selector lever position, shift lock / ignition key removal lock, shift behavior, instrument cluster insert display
- Foot-operated and hand-operated parking brake: Function, free travel and effectiveness, pulling to one side, juddering, squeal.
- ABS function: A pulsing at the brake pedal must be felt when performing ABS controlled braking
- Steering: Function, steering free play, steering wheel centralized when wheels are in straight ahead position
- Sunroof: Function
- Radio, Radio/Navigation system: Function, Reception, SVC, interference
- Multifunction indicator (MFI): Functions
- A/C system: Function
- Vehicle: Moving off line when travelling straight ahead (level road)
- Imbalance: Wheels, drive axles, prop shafts
- Wheel bearings: Noises
- Engine: Hot starting behavior

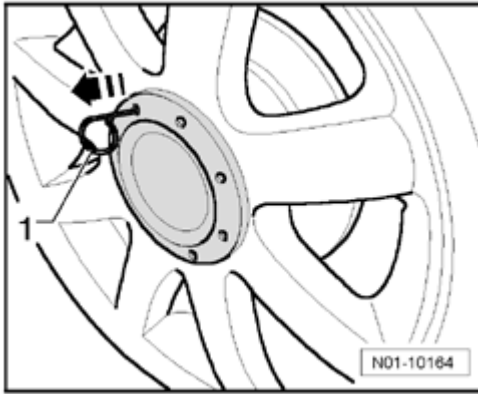
### **Wheel securing bolts, tightening to correct torque setting**

#### **Special tools, testers and auxiliary items required**



- Torque Wrench 40-200Nm VAG1332

#### **Removing wheel center cap:**



Extractor - **1** - for removing cap is located in vehicle tool kit.

- Hook extractor in one hole of wheel center cap and remove in - **direction of arrow** - .

### **Pulling off wheel bolt cover caps:**

#### **Note:**

- *Caps of wheel bolts must be removed before wheels bolts are removed.*

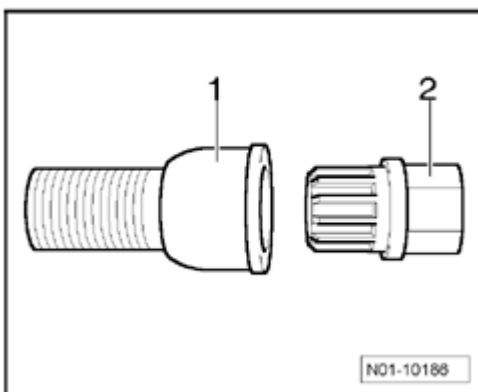
The extractor for removing the caps is located in the vehicle tool kit.

- Insert the wire bracket through opening in cap.
- Pull off cap using wire bracket.

### **Loosen anti-theft wheel bolts:**

#### **Note:**

- *A special adapter, needed for loosening anti-theft wheel bolts, is located in vehicle tool kit.*



- Slide adapter - **2** - into anti-theft wheel bolt until stop - **1**
- .
- Slide lug wrench onto adapter until stop - **2** - .
- Loosen wheel bolt approx. one turn.

### **Tighten wheel bolts:**

#### **Note:**

- *Ensure that wheel bolts are tightened alternately to the following tightening torque:*
  
- *Place adapter and extractor with vehicle tool kit after completing work.*

Tightening torque: 120 Nm

### **Radio navigation system, activating Anti-theft Coding**

#### **Radio "Sound System" - electronic anti-theft system**

Radio - "Sound System" is equipped with an electronic Comfort anti-theft system which operates in conjunction with radio unit identification data stored in the instrument cluster.

When an existing radio is removed (radio power supply disconnected) and reinstalled in the same vehicle, it is not necessary to input the anti-theft security code.

#### **Electronic anti-theft system, function**

After first activation of electronic anti-theft system, a numeric code is stored in both the radio unit and instrument cluster. When the radio power supply is restored ( e.g. after removing and installing radio or battery), a data exchange takes place between the radio and instrument cluster.

The data exchange compares the numeric code of the radio unit to the numeric code stored in the instrument cluster. If numeric code is identical, the instrument cluster recognizes that the radio "belongs to the vehicle" and is ready for operation.

Should a radio be replaced, the anti-theft code must be entered.

Deactivating electronic anti-theft system, see "Electronic anti-theft system, deactivating" below.

Next, when the ignition key is inserted into the ignition switch ( "S-contact" activated), the data exchange between the replacement radio and instrument cluster take place automatically.

**The data exchange lasts about 5 seconds. During this time a VAS 5051/5052/5052 must not be connected or remain connected.**

After successful data exchange, the replacement radio unit is ready for operation without renewed input of anti-theft code (should power supply subsequently be disconnected and reconnected).

The electronic anti-theft system is activated and will lock the radio as soon as:

- radio unit is installed in a different vehicle
- instrument cluster is replaced

A radio which has been locked by the electronic anti-theft system will show "SAFE" and "1000" on display when switched on.

To cancel lock, deactivate electronic anti-theft warning system, see "Electronic anti-theft system, deactivating" below.

### **Electronic anti-theft system, deactivating**

Reactivating a locked radio is only possible by entering correct code number for electronic anti-theft system.

#### **Note:**

- *Code number for electronic anti-theft system is listed along with radio serial number on radio card, ⇒ operating instructions .*
- *For security reasons, radio card should not be stored in the vehicle. Obtain the code number from the customer, if necessary.*
- *If a radio is replaced, code number from replacement radio must be used.*
- *Inform the customer that the code number has changed.*

- Obtain radio code number.
- Switch on radio unit.

Radio displays "SAFE" and then "1000" . No button inputs are required.

- Using station buttons -1- to -4-, enter code number affixed to radio card. Press preset button 1 to enter first digit of code number, preset button 2 for second digit and so on.
- Then press the **Arrow** button, which is located above the **FAD** button and hold it firmly until the anti-theft coding is activated. This is indicated by a short signal sound.

If the code number has been entered correctly into radio unit, a radio frequency appears on the display.

**Note:**

- *If the anti-theft code has been entered incorrectly, it can be corrected immediately in another attempt. If anti-theft code is entered incorrectly twice, then the radio unit is locked for an hour. Radio unit can then be switched on and insert ignition key in ignition lock. After one hour, then the procedure for deactivating the electronic anti-theft system can be repeated. Remember: Always two attempts to input code, after that the radio unit is locked for one hour.*

**Radio "Premium Sound System" - Electronic anti-theft system**

Radio - "Premium Sound System" is equipped with an electronic Comfort anti-theft system which operates in conjunction with radio unit identification data stored in the instrument cluster.

When an existing radio is removed (radio power supply disconnected) and reinstalled in the same vehicle, it is not necessary to input the anti-theft security code.

**Electronic anti-theft system, function**

After first activation of electronic anti-theft system, a numeric code is stored in both the radio unit and instrument cluster. When the radio power supply is restored ( e.g. after removing and installing radio or battery), a data exchange takes place between the radio and instrument cluster.

The data exchange compares the numeric code of the radio unit to the numeric code stored in the instrument

cluster. If numeric code is identical, the instrument cluster recognizes that the radio "belongs to the vehicle" and is ready for operation.

Should a radio be replaced, the anti-theft code must be entered.

Deactivating electronic anti-theft system, see "Electronic anti-theft system, deactivating" below.

Next, when the ignition key is inserted into the ignition switch ( "S-contact" activated), the data exchange between the replacement radio and instrument cluster take place automatically.

**The data exchange lasts about 5 seconds. During this time a VAS 5051/5052/5052 must not be connected or remain connected.**

After successful data exchange, the replacement radio unit is ready for operation without renewed input of anti-theft code (should power supply subsequently be disconnected and reconnected).

The electronic anti-theft system is activated and will lock the radio as soon as:

- radio unit is installed in a different vehicle
- instrument cluster is replaced

A radio which has been locked by the electronic anti-theft system will show "SAFE" and "1000" on display when switched on.

To cancel lock, deactivate electronic anti-theft warning system, see "Electronic anti-theft system, deactivating" below.

### **Electronic anti-theft system, deactivating**

Reactivating a locked radio is only possible by entering correct code number for electronic anti-theft system.

#### **Note:**

- *Code number for electronic anti-theft system is listed along with radio serial number on radio card, ⇒ operating instructions .*
- *For security reasons, radio card should not be stored in the vehicle. Obtain the code number from the customer, if necessary.*

- *If a radio is replaced, code number from replacement radio must be used.*
- *Inform the customer that the code number has changed.*

- Obtain code number for the unit.
- Switch on radio unit.

Radio displays "SAFE" and then "1000" . No button inputs are required.

- Using station buttons -1- to -4-, enter code number affixed to radio card. Press preset button 1 to enter first digit of code number, preset button 2 for second digit and so on.
- Then press the **Stations** button located beneath "OK" on the display (normally it is the last station button) and hold it firmly until anti-theft coding is activated. This is indicated by a short signal sound.

If the code number has been entered correctly into radio unit, a radio frequency appears on the display.

**Note:**

- *If the anti-theft code has been entered incorrectly, it can be corrected immediately in another attempt. If anti-theft code is entered incorrectly twice, then the radio unit is locked for an hour. Radio unit can then be switched on and insert ignition key in ignition lock. After one hour, then the procedure for deactivating the electronic anti-theft system can be repeated. Remember: Always two attempts to input code, after that the radio unit is locked for one hour.*

**Radio "Radio - Navigation System" Electronic anti-theft system**

Radio - Navigation System is equipped with an electronic Comfort anti-theft system which operates in conjunction with radio unit identification data stored in the instrument cluster.

When an existing radio - navigation unit is removed (power supply disconnected) and reinstalled in the same vehicle, it is not necessary to input the anti-theft security code.

**Electronic anti-theft system, function**

After first activation of electronic anti-theft system, a numeric code is stored in both the radio - navigation unit and instrument cluster. When the unit power supply is restored ( e.g. after removing and installing unit or battery), a data exchange takes place between the radio - navigation unit and instrument cluster.

The data exchange compares the numeric code of the unit to the numeric code stored in the instrument cluster. If numeric code is identical, the instrument cluster recognizes that the radio - navigation unit "belongs to the vehicle" and is ready for operation.

Should a radio - navigation unit be replaced, the anti-theft code must be entered.

Deactivating electronic anti-theft system, see "Electronic anti-theft system, deactivating" below.

Next, when the ignition key is inserted into the ignition switch ( "S-contact" activated), the data exchange between the replacement radio - navigation unit and instrument cluster take place automatically.

**The data exchange lasts about 5 seconds. During this time a VAS 5051/5052/5052 must not be connected or remain connected.**

After successful data exchange, the replacement unit is ready for operation without renewed input of anti-theft code (should power supply subsequently be disconnected and reconnected).

The electronic anti-theft system is activated and will lock the radio - navigation unit as soon as:

- radio - navigation unit is installed in a different vehicle
  
- instrument cluster is replaced

A radio - navigation unit which has been locked by the electronic anti-theft system will show "SAFE" and "1000" on display when switched on.

To cancel the lock, deactivate the electronic anti-theft warning system, see "Electronic anti-theft system, deactivating" below.

### **Electronic anti-theft system, deactivating**

Reactivating a locked radio navigation system is only possible by entering correct code number for electronic

anti-theft system.

**Note:**

- *Code number for electronic anti-theft system is listed along with radio serial number on radio card, ⇒ operating instructions .*
- *For security reasons, radio card should not be stored in the vehicle. Obtain the code number from the customer, if necessary.*
- *If a radio navigation system is replaced, code number from replacement unit must be used.*
- *Inform the customer that the code number has changed.*

- Obtain radio code.

- Switch on radio navigation system.

The word "SAFE" and the number row "0000" appear in the display.

- Enter the code number listed on the radio card, do this by selecting and confirming characters on the selection screen for letters and numbers in succession.

**Note:**

- *With the entry of the first character, the number row "0000" is overwritten.*

- Confirm code by pressing the right rotary press button.

- When the anti-theft code has been entered, confirm with Taste located next to the word "OK" on the display.

The unit is enabled and ready for operation.

**Note:**

- *If the anti-theft code has been entered incorrectly, it can be corrected immediately in two subsequent attempts. If anti-theft code is entered incorrectly three times, then the radio navigation system is locked for an hour. Radio navigation system can then be switched on and insert ignition key in ignition lock. After one hour, then the procedure for deactivating the electronic anti-theft system can be*

*repeated. Remember: Always three attempts to input code, after that the radio navigation system is locked for one hour.*

### **Tire pressure monitoring display, performing basic setting**

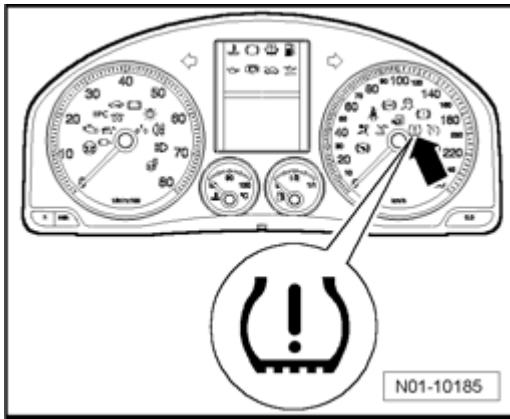
#### **Note:**

- *Basic setting of Tire Pressure Monitoring Display Indicator Lamp K220 should always be performed only "after" having corrected tire pressure values to correct values.*
  
- *If no tire pressure loss or tire damage is determined after a tire pressure warning, the malfunctioning warning can be erased by a basic setting.*

The Tire Pressure Monitoring System (TPMS) is a software component in ABS Control Module J104 .

The ABS control module compares the speed and thus the rolling circumference of the individual wheels using the ABS sensors. If there is a change in rolling circumference of a wheel, this is indicated via Tire Pressure Monitoring System (TPMS). The wheel circumference of a tire changes when:

- Tire pressure is too low.
  
- Tire has structural damage.
  
- Load is imbalanced in vehicle to one side.
  
- Wheels of one axle are heavily loaded (e.g. when pulling a trailer or when driving up- and downhill).
  
- Snow chains are used.
  
- Spare wheel is mounted.
  
- One wheel on an axle was replaced.

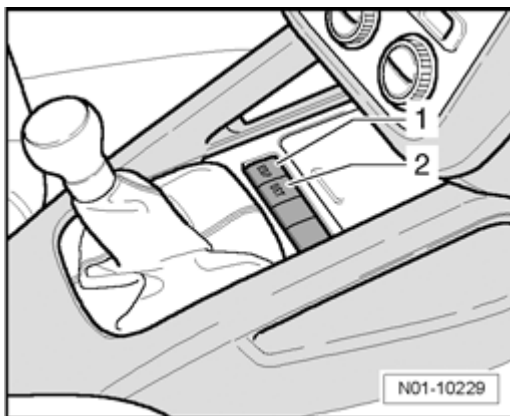


Tire Pressure Monitoring Display Indicator Lamp K220 is indicated by a yellow warning lamp in the instrument cluster - **arrow** - .

- "FLASHING LIGHT" means that no "INITIAL BASIC SETTING" has been performed yet.
- "CONSTANT LIGHT" in conjunction with a warning tone means "WARNING" , a tire pressure loss was detected, check tire pressure, perform basic setting.

### Performing "INITIAL" basic setting

- Switch ignition on.



- Press button for ESP - **1** - and button SET - **2** - in center console simultaneously for more than 2 seconds.

If button ESP is not present, press button for ASR .

Start of basic setting is indicated by a tone.

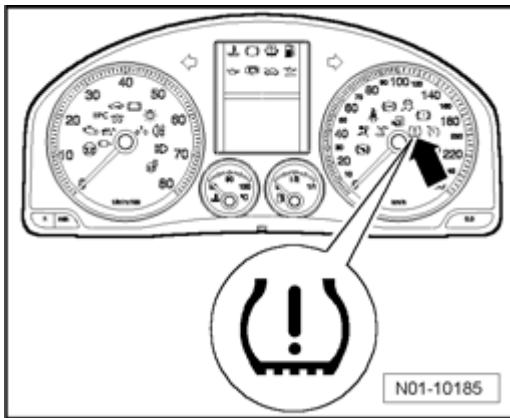
When switching ignition on next time, warning tone will no longer be heard.

### Performing basic setting

- Switch ignition on.

- Press button for ESP - 1 - and button SET - 2 - in center console simultaneously for more than 2 seconds.

If button ESP is not present, press button for ASR .



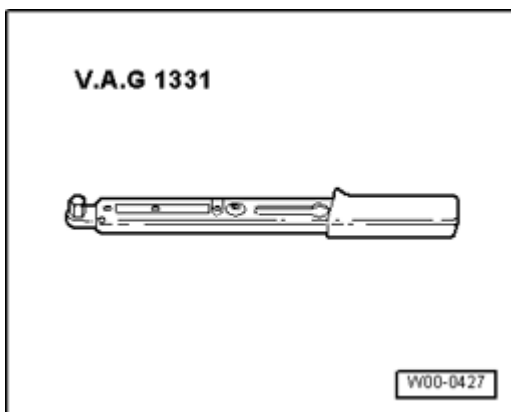
Tire Pressure Monitoring Display Indicator Lamp K220 lights up in instrument cluster - **arrow** - as long as button is pressed.

Start of basic setting is indicated by a tone.

When switching ignition on next time, warning tone will no longer be heard.

### **Intake manifold bolts, tightening flange bolts to tightening torque (2.5L 5-cyl. fuel injected engine)**

#### **Special tools, testers and auxiliary items required**



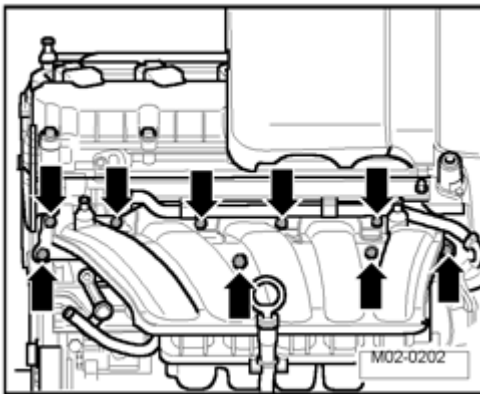
- Torque Wrench 5-50Nm VAG1331
- Bit XZN 18 T10107 A

#### **Required work conditions:**

- Engine cover was already removed for replacing spark plugs, ⇒ [01-5, Spark plugs, replacing](#) .

**Note:**

- *At intake manifold bolt connection, flange bolts should be retightened to tightening torque, e.g. when replacing spark plugs.*
- *This covers vehicles of model year 2005, with Vehicles Identification Numbers (VIN) 1K5M600098 to 1K5M603002.*

**Work procedure:**

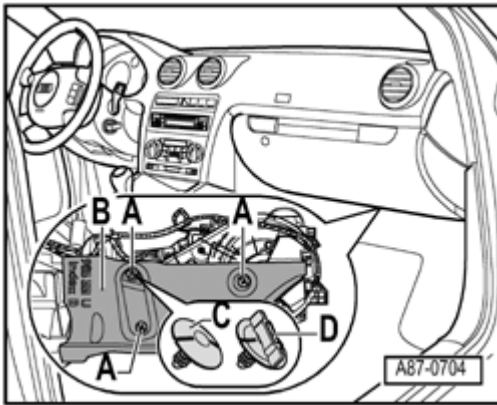
- Check tightening torque of 9 bolts - **arrows** - using Torque Wrench 5-50Nm VAG1331 and socket and extended bit T10107 A .

- Tightening torque is 9 Nm.

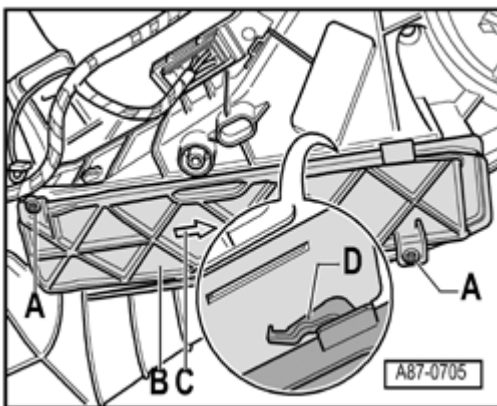
**Dust and pollen filter, cleaning housing and replacing filter element****Note:**

- *Clean surrounding area of dust and pollen filter in air conditioner/heater shaft before installing new filter.*

- Perform the following work procedure:



- Remove screw clips - **A** - and remove insulation mat - **B** - .

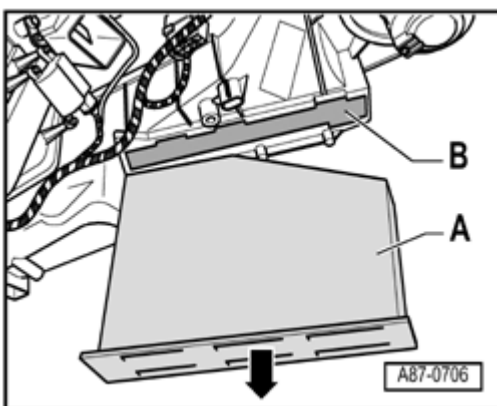


Screw clips - **A** - come in different versions, e.g. - **C** - and - **D** - .

- If necessary, remove bolts - **A** - .

Bolt - **A** - is not installed in all vehicles. Bolts secure the cover - **B** - in case catches - **D** - no longer hold.

- Push cover - **B** - in direction of arrow - **C** - and remove cover.



- Remove filter element - **A** - out of shaft - **B** - of air conditioner or heater.

**Note:**

- *Observe disposal regulations!*

- Clean shaft - **B** - of air conditioner or heater e.g. using a vacuum cleaner.

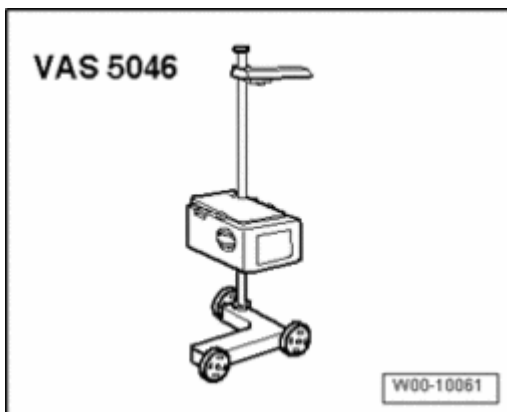
- Install in reverse order of removal.

**Headlight setting, checking**

Adjusting Halogen headlights, ⇒ [01-5, Adjusting main headlights with halogen lamps](#) .

Adjusting gas-discharge headlights, ⇒ [01-5, Adjusting main headlights with gas discharge lamps](#) .

Adjusting fog lights and other auxiliary headlights, ⇒ [01-5, Adjusting fog lights and other auxiliary headlights](#) .

**Test requirements****Special tools, testers and auxiliary items required**

- Headlight adjuster VAS 5046 or
- Headlight adjuster VAS 5047

**Test and adjustment requirements:**

- Tire pressure OK
- Lenses must not be damaged or dirty.
- Reflectors and bulbs OK.
- Vehicle load must be established.

- Vehicle and headlight adjuster must be on a level surface. ⇒ *Operating instructions for headlight adjuster VAS 5046* or ⇒ *operating instructions for headlight adjuster VAS 5047*
- Vehicle and headlight adjuster must be aligned.
- Inclination measure must be set.

Inclination specification in "%" is embossed in trim above headlight. Headlights must be adjusted according to this specification. Percentage specification is based on a projection distance of 10 meters. For example: inclination of 1.0 % converts to approx. 10 cm.

**For vehicles with Halogen headlights with manual headlight range control:**

- Thumb wheel for headlight range control must stand in position - **0** - .

Load: With one person or 75 kg on the drivers seat with otherwise unloaded vehicle (curb weight).

The curb weight is the weight of the vehicle ready for operation with completely filled fuel tank (at least 90 %), including the weight of all equipment items carried for operation (e.g. spare wheel, tool, vehicle jack, fire extinguisher etc.).

If the fuel tank is not filled to at least 90 %, establish the load as follows:

- Check fill level of fuel tank via fuel gauge. Determine the additional weight according to the following table and place the weight in the luggage compartment.

Table of filling quantity:

Fill level of fuel gauge	Additional weight in kg
1/4	30
1/2	20
3/4	10
Full	0

Example:

If the tank is filled half way, an additional weight of 20 kg must be placed into the luggage compartment.

**Note:**

- *As additional weight it is recommended to use fuel canisters filled with water (a 5-liter fuel canister weighs approximately 5 kg).*

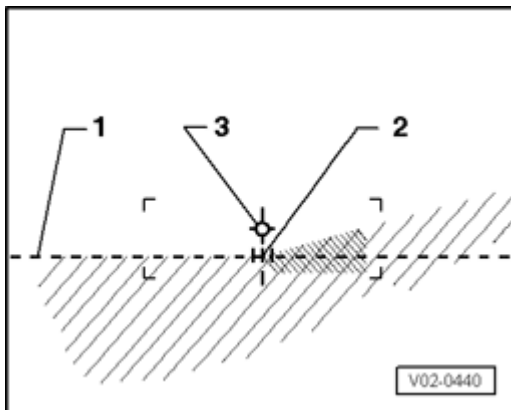
**Vehicles with manual headlight range control:**

- Thumb wheel for headlight range control must stand in position - **0** - .

**Checking headlight setting (with test screen without 15° setting line)**

**Main headlights:**

Check the following:



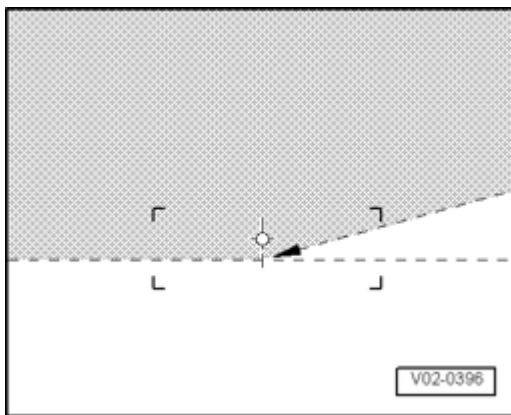
- With the low beam switched on, check whether the horizontal light-dark border contacts the hyphenated line - **1** - of the test surface and

- whether the break-away point - **2** - between the left horizontal part and the rising part on the right of the light-dark border runs vertically through the central point - **3** - . The bright core of the light beam must be on the right of the vertical line.

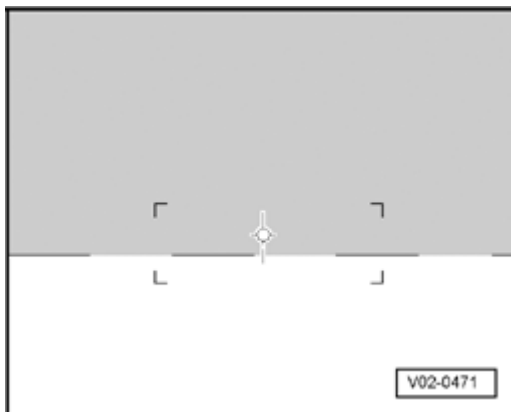
**Note:**

- *To make it easier to find break-away point - **2** - cover and uncover left half of headlight (as viewed when looking forward) a few times. Then check low beam again.*
- *After correct adjustment of low beams the center*

*point of the light beam of high beams must lie on the central mark - 3 - .*



- *For the previous test screen with 15° -setting line, adjust as for new test screen. To avoid incorrect settings disregard 15° -setting line.*



### **Fog lights:**

- Check whether the upper light-dark border touches the setting line and runs across the entire test screen width horizontally.

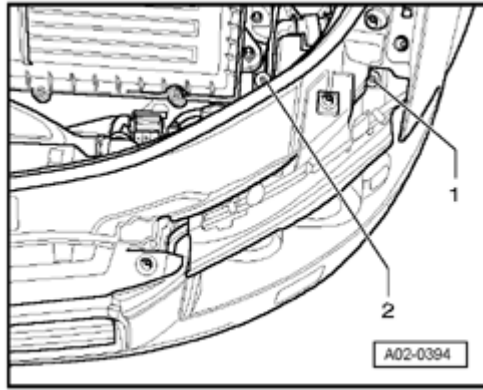
Other auxiliary headlights:

Later inserted auxiliary headlights of other systems must be checked and adjusted according to the guidelines applicable to them.

### **Adjusting main headlights with halogen lamps**

#### **Main headlight (left):**

Adjustment screws for right headlight are arranged symmetrically

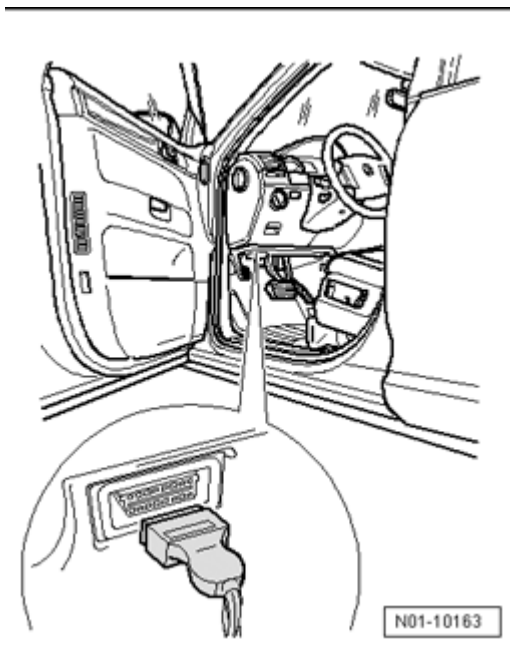


- Adjustment screw - 1 - for vertical adjustment
- Adjustment screw - 2 - for vertical-/lateral adjustment

- For vertical adjustment, turn adjustment screws - 1 - and - 2 - with the same number of rotations.
- Only use adjustment screw - 2 - for lateral adjustment.

#### Adjusting main headlights with gas discharge lamps

#### Perform basic setting:



- Connect diagnostic tester ⇒ [01-3, Diagnostic tester, connecting](#) .
- Switch on ignition.
- Select "Guided Fault Finding" .

Enter vehicle data, all control modules are checked.

- Select the following options in the sequence indicated:
  - Go to
  - Function/Component selection
  - Body
  - Electrical system
  - 01 - On Board Diagnostic (OBD) capable systems
  - 55 - Dynamic vertical headlight aim control
  - J431 - Headlamp Range Control Module, functions
  - J431- Headlamp Range Control Module, basic setting
  - Press → button

- Follow the procedure on tester and confirm the entry until the following text is displayed:

J431- Headlamp Range Control Module, basic setting

- Press → button

- Follow the procedure on tester and confirm the entry until the following text is displayed:

J431- Headlamp Range Control Module, basic setting

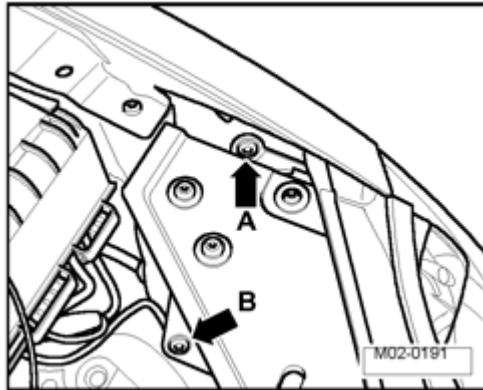
- Follow the procedure on tester.
- Check headlight adjustment and correct if necessary
- Complete function program for J431-Headlamp Range Control Module, basic setting.

**Note:**

- *Also check whether both headlights work evenly when operating the manual headlight range control.*

### Adjusting left main headlight:

Adjustment screws for right headlight are arranged symmetrically



- Adjustment screw - **A** - for vertical adjustment
- Adjustment screw - **B** - for vertical-/lateral adjustment

- For vertical adjustment, turn adjustment screws - **A** - and - **B** - with the same number of rotations.

### Adjusting fog lights and other auxiliary headlights

#### Fog lights in main headlights:

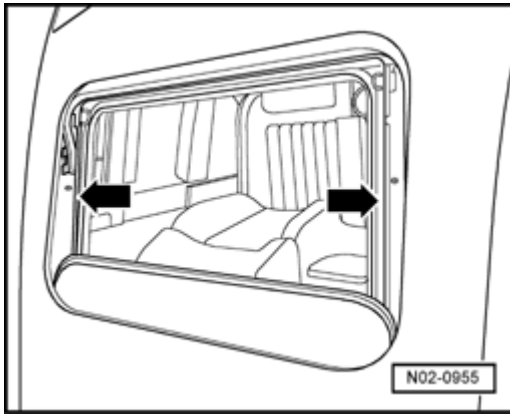
**Note:**

- *Adjustment of fog lights occurs automatically with adjustment of main headlights.*

#### Other auxiliary headlights

Later inserted auxiliary headlights of other systems must be checked and adjusted according to the guidelines applicable to them.

#### Sunroof, checking function, cleaning and lubricating guide rails



Perform the following work procedure:

- Check function of sunroof.
- Clean guide rails - **arrows** - and lubricate with special grease.

### Windshield wash/wipe system and headlight wash system, check function

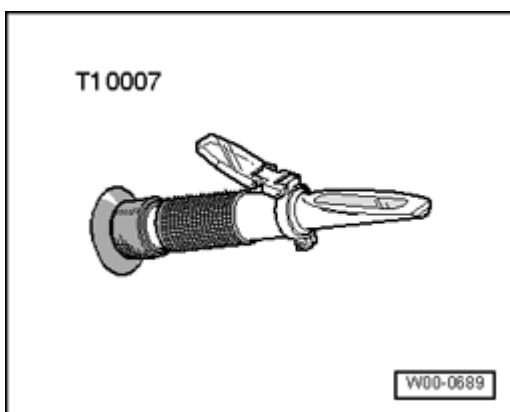
Check freeze protection of windshield cleaner concentrate G 052 164 , top-off if necessary ⇒ [01-5, Checking frost protection content of fluid, if necessary top off with fluid](#) .

Windshield wipe-/wash system: Check spray nozzle adjustment, adjust if necessary ⇒ [01-5, Windshield wipe-/wash system, check spray nozzle adjustment, adjust if necessary](#) .

Headlight wash system: Check spray nozzle adjustment, adjust if necessary ⇒ [01-5, Headlight wash system, check spray nozzle adjustment, adjust if necessary](#) .

**Checking frost protection content of fluid, if necessary top off with fluid**

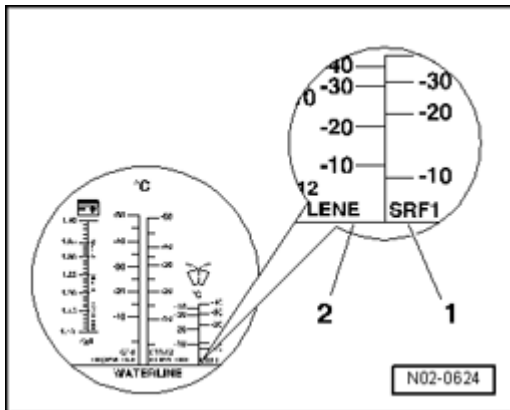
**Special tools, testers and auxiliary items required**



- Refractometer T10007

Read the bright/dark boundary to obtain an accurate reading for the following tests. Place a drop of water on the glass to improve the readability of the bright/dark boundary. The bright/dark boundary can be clearly recognized on the "WATERLINE" .

- Check the concentration of the anti-freeze additive using refractometer T10007 (operating instructions).



Scale - 1 - of refractometer applies to windshield cleaner concentrate G 052 164 .

The scale - 2 - is designed for commercially available windshield cleanser as well as a mixture of commercially available windshield cleanser and windshield cleaner concentrate G 052 164 .

**Mixture ratio:**

Freeze protection to	W/screen clear G 052 164	Water
-17/-18 ° C	1 part	3 parts
-22/-23 ° C	1 part	2 parts
-37/-38 ° C	1 part	1 part

**Filling-up with fluid:**

The windshield wash/wipe system fluid reservoir must be filled up fully.

Use only windshield cleaner concentrate G 052 164 all-year-round when topping-up the windshield wash/wipe system.

**Note:**

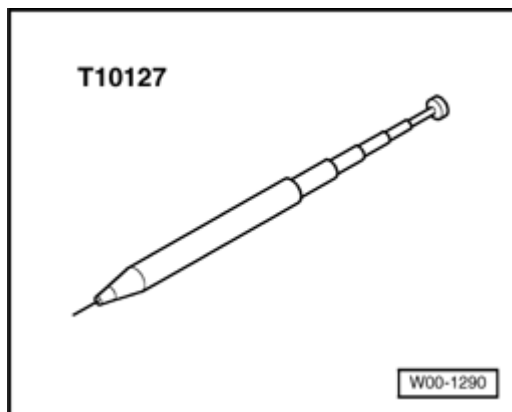
- Windshield cleaner concentrate G 052 164 protects the spray nozzles, fluid reservoir and hoses from

freezing.

- *All vehicles with fan type spray jets must be filled with windshield cleaner concentrate G 052 164 as this fluid has a low viscosity at minus temperatures. The complicated spray jet system could otherwise become blocked due to crystallized washer fluid and adversely affect the fan pattern of the spray jet. Windshield cleaner concentrate G 052 164 assures that the fan type spray jets remain functional even at low temperatures.*
- *Fill with windshield cleaner concentrate G 052 164 in the warmer season also. The powerful cleanser removes wax and oil deposits from the windows.*
- *Frost protection (anti-freeze) must be guaranteed to approx. -25 ° C (approx. -35 ° C in countries with an arctic climate) in the washer system.*

**Windshield wipe-/wash system, check spray nozzle adjustment, adjust if necessary**

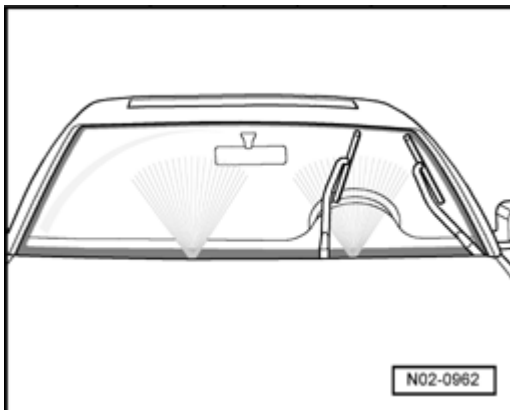
**Special tools, testers and auxiliary items required**



- Adjustment tool T10127 equipped with needle 3125/5 A

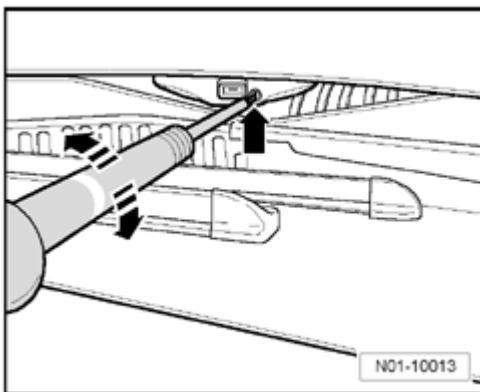
**Note:**

- *The spray jets must not be cleaned opposite to direction of spray, e.g. blown-through from front.*



### Spray nozzle adjustment of front window:

The washer nozzles are preset. Small height adjustments can be made.



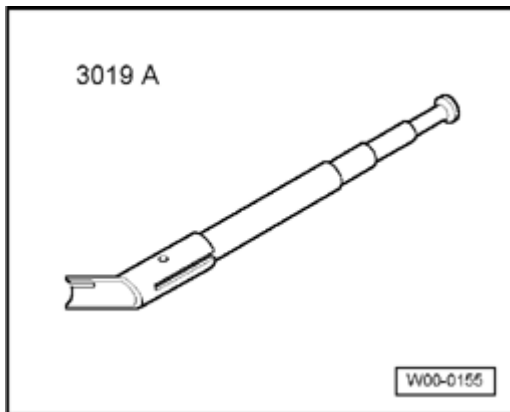
- If both spray fields are not at same height, adjust spray direction upward or downward as follows:

- Adjust the spray stream by turning at the adjuster - **arrow** - with a screwdriver.

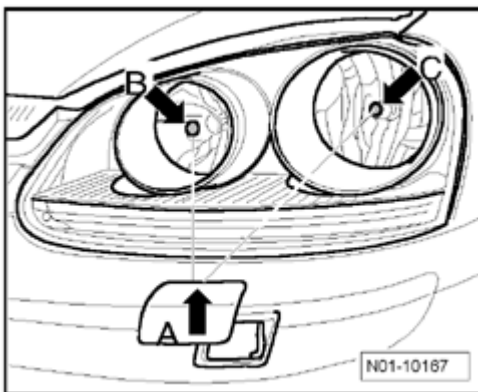
- "Clockwise" deeper adjustment.
- "Counterclockwise" higher adjustment.

**Headlight wash system, check spray nozzle adjustment, adjust if necessary**

**Special tools, testers and auxiliary items required**



- adjustment fixture 3019A or
- Adjustment device T10167



Spray jet adjustment for left headlight (right headlight is identical but reversed)

### **Check spray jet setting.**

- Switch on driving lights.
- Operate windshield washer system for front window.

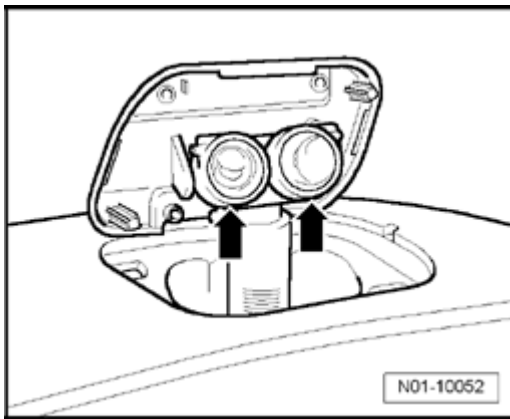
Headlights are washed when windshield washer lever is held in "wipe position" at least 1.5 seconds.

Spray pattern should encounter headlight lamps at center, see - **B** - and - **C** - .

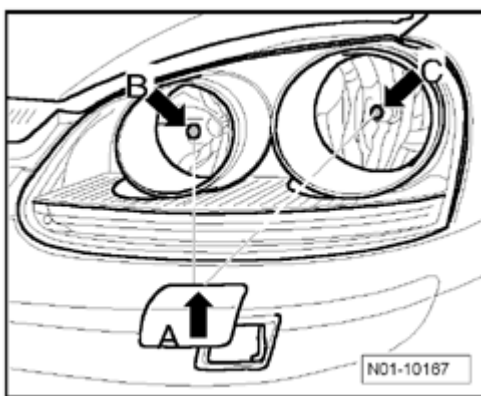
### **Adjusting nozzles**

- Switch on driving lights.
- Operate windshield washer system for front window.

Headlights are washed when windshield washer lever is held in "wipe position" at least 1.5 seconds.



Spray nozzles - **arrow** - are driven outward.



- Perform the following work procedure:

- Direct the spray direction of respective nozzle using adjustment tool T10167 or adjustment tool 3019A at upper edge of headlight, - **item B** - and - **item C** - .

### Windshield wiper blades, checking rest position

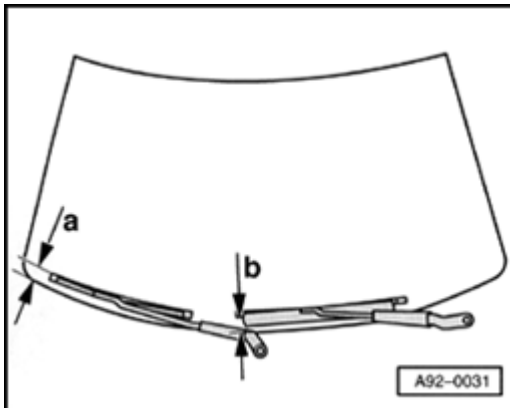
#### Front windshield wiper blades: Checking rest position

##### **Note:**

- *Every second time the wiper motor is switched off it returns the wiper arms to a slightly higher rest position, thus tipping the wiper blade lips the other way.*
- *To achieve this, the wiper motor moves the wiper arms to rest position and then slightly again. This raised rest position must not be used to adjust/check the wiper crank.*
- *To check, use rest position where wiper motor runs directly into normal end position (not lowered). If*

*necessary, operate touch-sweep function once again.*

- Switch windshield wiper on and off and let run to end position.
- Switch ignition off.



- Check the distance between wiper blade tips and plenum chamber cover at bottom edge of windshield:
  - Dimension - **a** - = 0...10 mm
  - Dimension - **b** - = 10...20 mm

- If necessary, adjust wiper arm:

Adjusting windshield wiper blades

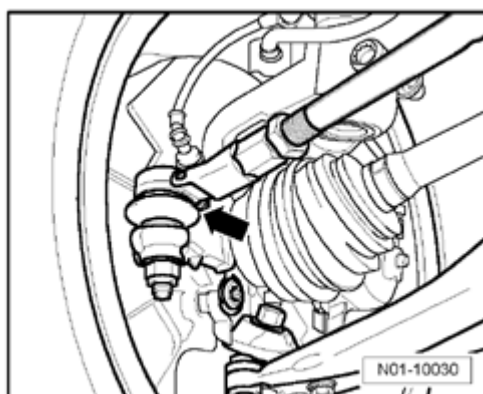
⇒ [Repair Manual, Electrical Equipment, Repair Group 92, Windshield wiper blades - end position](#)

.

### **Tie rod ends, checking play, security and joint boots**

Perform the following work procedure:

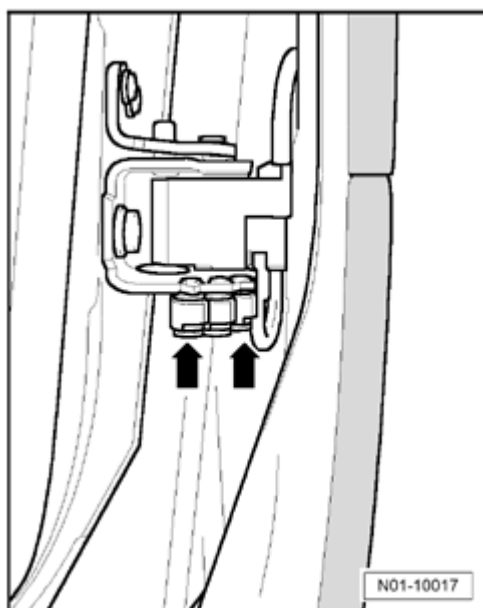
- With vehicle raised (wheels hanging free), check play by moving track rods and wheels. Play: none
- Check mountings.



- Check track rod joint boots - **arrow** - for damage and proper seating.

### Door arrester, lubricating

Perform the following work procedure:



- Grease door arrester at points shown - **arrows** - .

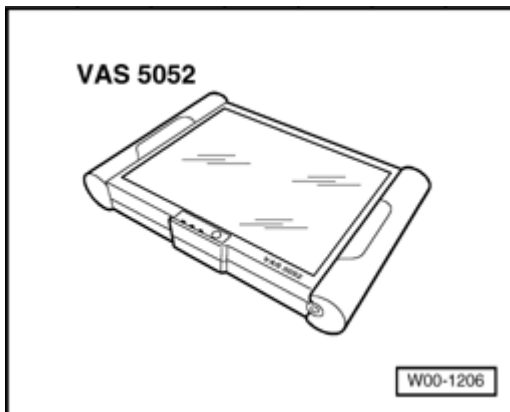
Use solid lubricant G 000 150 .

### Transport mode, switch off

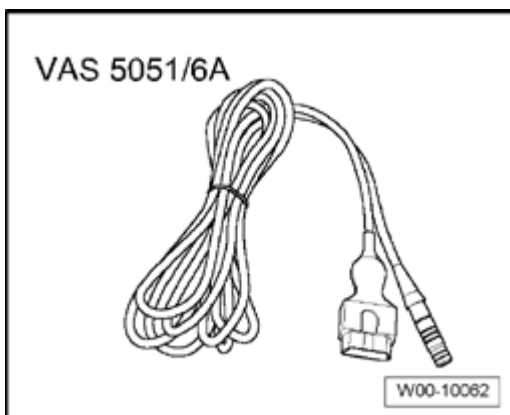
**Special tools, testers and auxiliary items required**



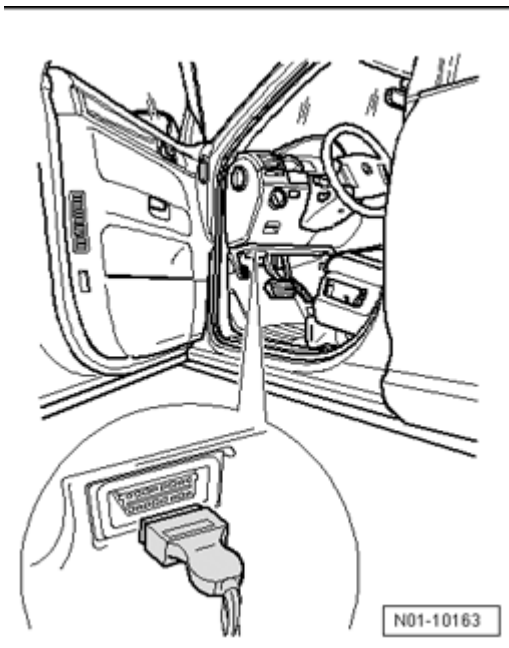
- Diagnostic Operation System VAS5051A



- Vehicle Diagnosis Service Syst. VAS5052 or succeeding models

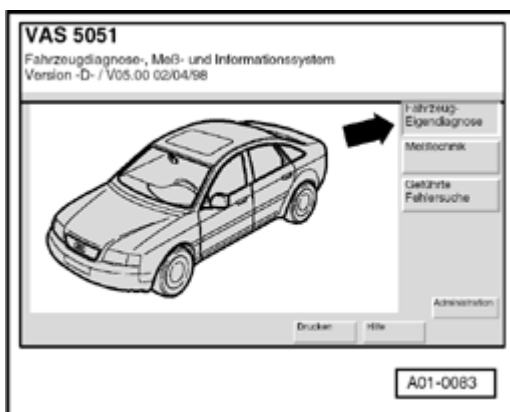


- Diagnostic Cable-5 Meters VAS5051/6A



- Connect Diagnostic Operation System VAS5051A or Vehicle Diagnosis Service Syst. VAS5052 via Diagnostic Cable-5 Meters VAS5051/6A .

- Switch on ignition



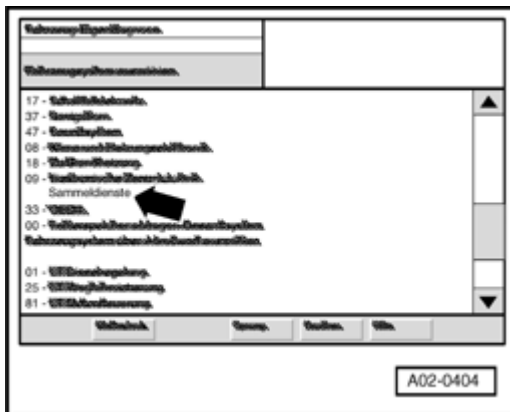
Indicated on display:

### Select operating mode

- Press "Vehicle Self-Diagnosis" on display.

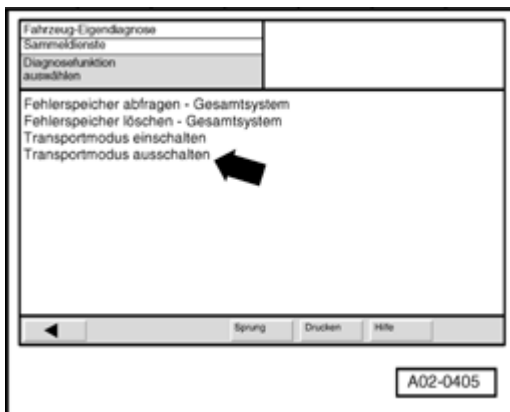
### Note:

- *If indications shown in work procedure are not shown on display: ⇒ Operating instructions for Diagnostic Operation System VAS5051A or Vehicle Diagnosis Service Syst. VAS5052 .*



Indicated on display:

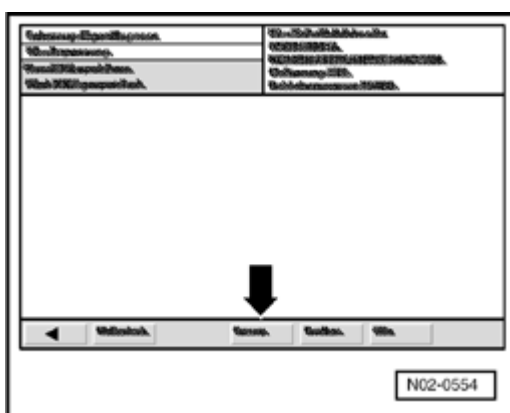
- Press "Collecting services" on display



Indicated on display:

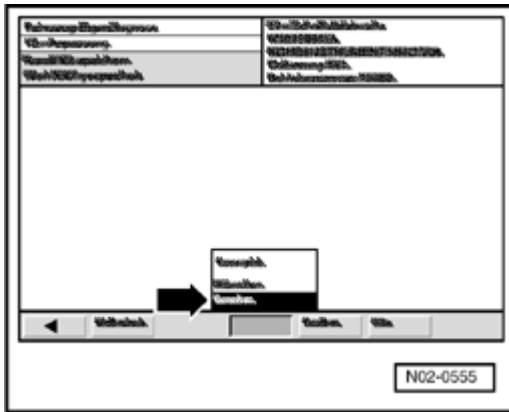
- Press "Switch off transport mode" on display

## End Output



Indicated on display:

- Press "Go to" button - **arrow** - on the display.



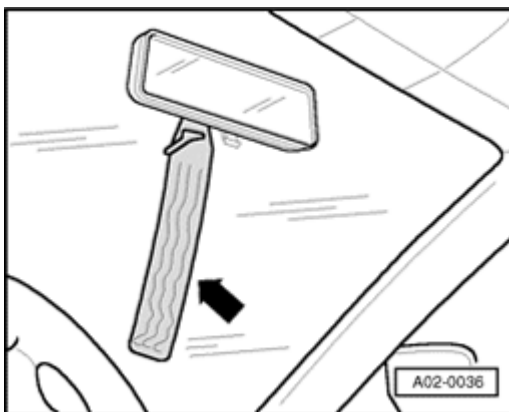
Indicated on display:

- Press "End" button - **arrow** - on the display.
- Press "End" button in the exit menu.
- Switch ignition off.

**Note:**

- *Diagnostic Operation System VAS5051A or Vehicle Diagnosis Service Syst. VAS5052 may possibly remain connected for various tests.*

**Transport locks, removing locking elements from front axle springs**



There are locking elements installed in front axle springs on vehicles with sport suspension. These vehicles can be identified by a tag attached at the mirror - **arrow** - .

**Note:**

- *The locking elements prevent damage to vehicle caused by compression of springs when driving onto an auto transporter or railway car.*

**Warning!**

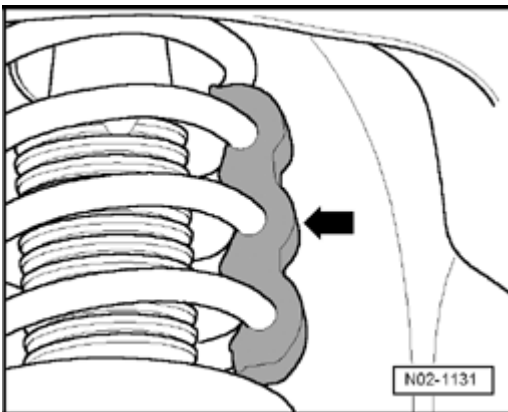
**Make sure that locking elements are removed before delivery! A "WARNING!" tag, attached to interior rearview mirror, is an explicit reminder.**

Perform the following work procedure:

**Note:**

- *Removal of the wheels is not necessary.*
- *Be careful not to damage surface of springs!*

- Relieve tension on coil springs by lifting vehicle using platform.



- Press locking element - **arrow** - off coil spring.

**Underbody sealant, performing visual check for damages**

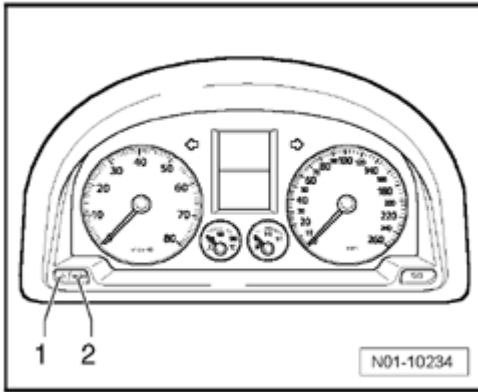
During visual check, observe floor pan, wheel housings and sills!

**Note:**

- *Malfunctions found must be rectified (repair measure). This inhibits corrosion and rusting through.*

**Clock, setting**

The adjustment buttons are located on left side under tachometer.



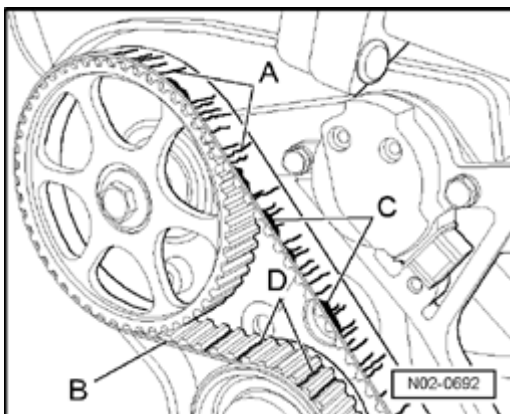
- Press left button - **1** - to adjust the hour. Press button only briefly to set one hour ahead.
- Press right button - **2** - to set the minutes. Press button only briefly to set one minute ahead.

### Toothed belt for camshaft drive - TDI pump injector engines, checking

#### Condition of toothed belt, checking

- Remove toothed belt cover,

⇒ *Repair Manual, 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BRM, Repair Group 15, Cylinder head, removing and installing*



- Check condition of toothed belt for:
  - - **A** - Cracks, cross-sectional breaks, tears (cover-side)

- - **B** - Lateral movement
- - **C** - Fraying of cord strands
- - **D** - Tears (in tooth base)
- Layer separation cover layer, cord strands)
- Surface cracks (plastic sheathing)
- Traces of oil and grease

**Note:**

- *It is essential to replace toothed belt if malfunctions are found. This will avoid possible break-downs or operating problems. The replacement of a toothed belt is a repair measure.*

**Toothed belt and toothed belt tensioning roller - TDI pump injector engines, replacing**

- Toothed belt, removing and installing

⇒ *Repair Manual, 1.9 Liter 4-Cyl. 2V TDI PD Engine Mechanical, Fuel Injection Glow Plug, Engine Code(s): BRM, Repair Group 15,*

.

**Toothed belt for camshaft drive - 2.0 L TFSI, replacing**

- Toothed belt, removing and installing

⇒ *Repair Manual, 2.0 Liter 4-Cyl. 4V Turbo Engine Mechanical, Fuel Injection Ignition, Engine Code(s): BPY, Repair Group 15,*

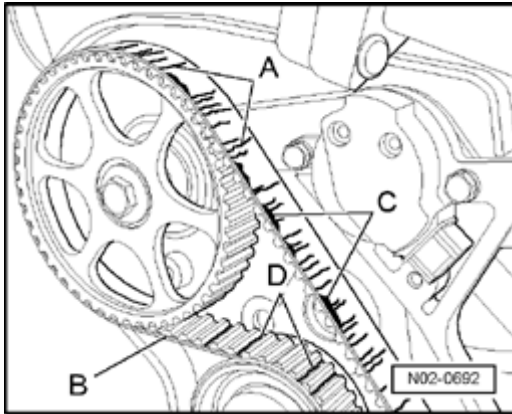
.

**Toothed belt for camshaft drive - 4 cyl. - Gasoline engines, checking**

**Condition of toothed belt, checking**

- Remove toothed belt cover,

⇒ *Repair Manual, Engine Mechanical, Repair Group 15, Cylinder head, removing and installing*



- Check condition of toothed belt for:
  - - **A** - Cracks, cross-sectional breaks, tears (cover-side)
  - - **B** - Lateral movement
  - - **C** - Fraying of cord strands
  - - **D** - Tears (in tooth base)
  - Layer separation (cover layer, cord strands)
  - Surface cracks (plastic sheathing)
  - Traces of oil and grease

**Note:**

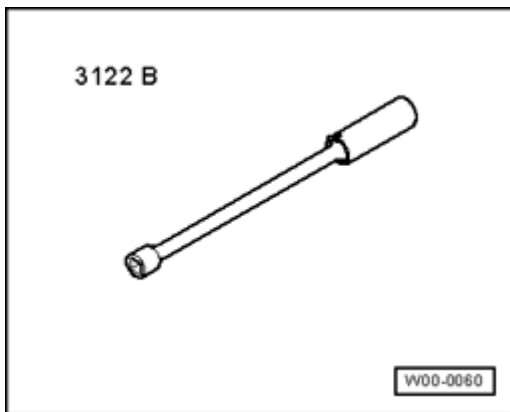
- *It is essential to replace toothed belt if malfunctions are found. This will avoid possible break-downs or operating problems. The replacement of a toothed belt is a repair measure.*

## Spark plugs, replacing

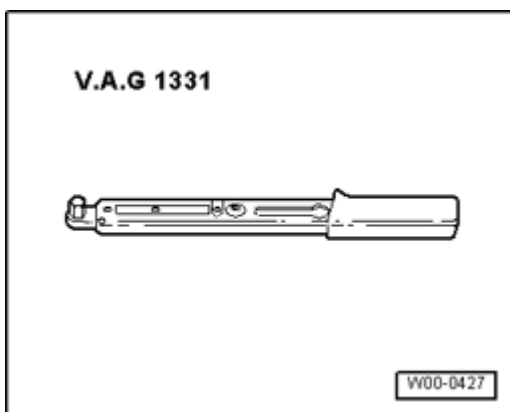
Replacing spark plugs, 2.0 L Turbo direct fuel injection engine ⇒ [01-5, Replacing spark plugs, 2.5 L fuel injected engine](#) .

Replacing spark plugs, 2.5 L fuel injected engine ⇒ [01-5, Replacing spark plugs, 2.5 L fuel injected engine](#) .

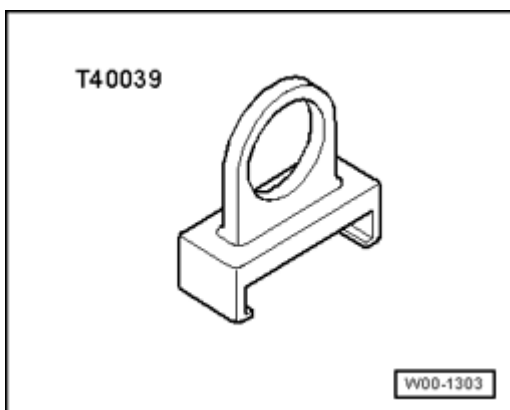
## Special tools, testers and auxiliary items required



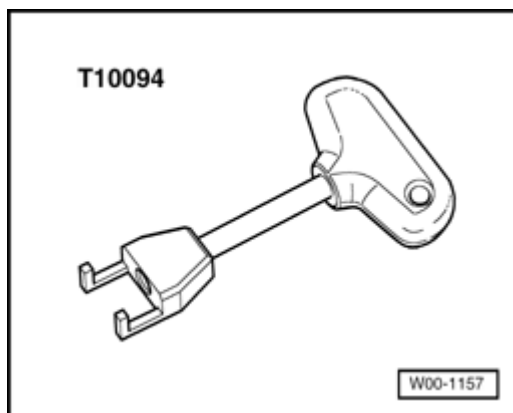
- Spark Plug Removal Tool 3122B



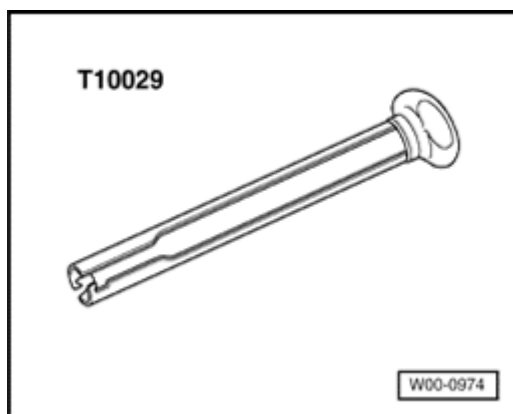
- Torque Wrench 5-50Nm VAG1331



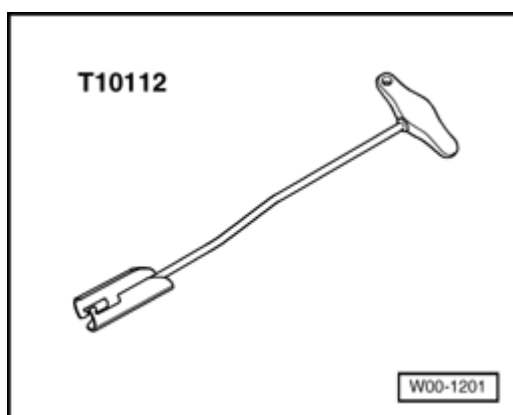
- Ignition Coil Puller T40039



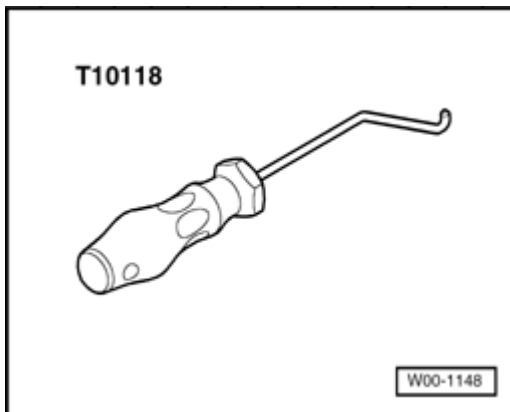
- Puller For Ignition Coil T10094



- Spark Plug Connector Tool T10029



- Puller T10112



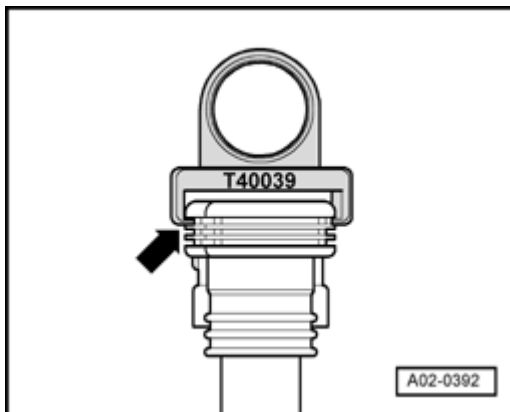
- Assembly Tool T10118

### Replacing spark plugs, 2.0 L Turbo direct fuel injection engine

#### Removing:

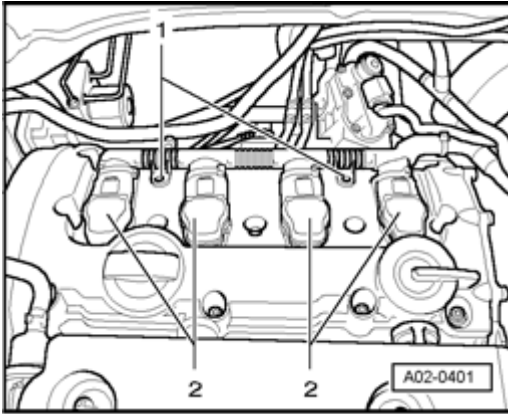
Perform the following work procedure:

#### Note:



- *To remove spark plugs, position Ignition Coil Puller T40039 at uppermost rib - **arrow** - of ignition coil with power output stage.*
- *If lower ribs are used, ribs could be damaged.*

- Remove engine covers, ⇒ [01-4, Upper engine cover, removing and installing](#) .

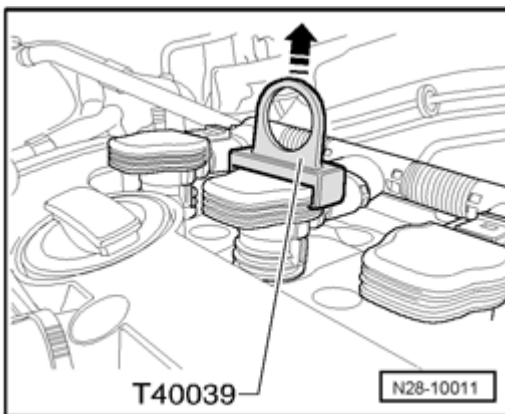


Spark plugs are located beneath ignition coils with power output stage - 2 - .

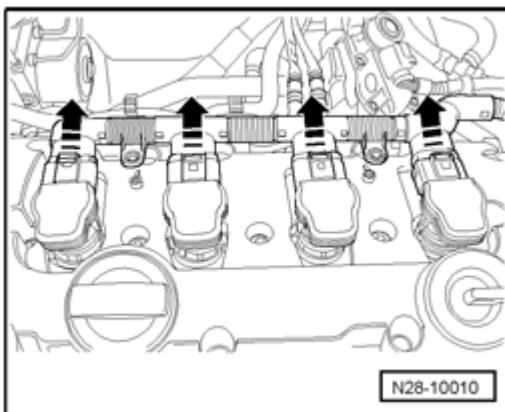
**Note:**

- *Note installation position of ignition coils with power output stage!*

- Remove both bolts - 1 - .

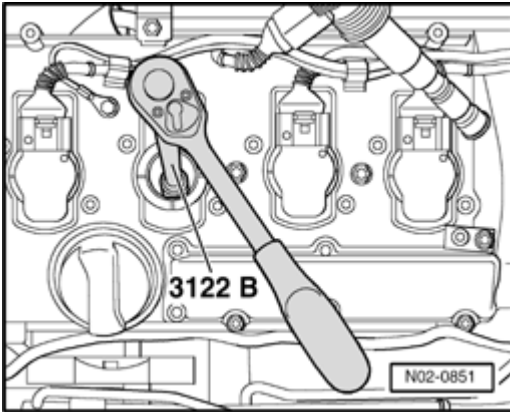


- Remove all ignition coils approx. 30 mm out of cylinder head in direction of - **arrow** - using Ignition Coil Puller T40039 .



- Push connector in direction of ignition coils with power

output stage, press catch down by hand and disconnect connector - **arrows** - .



- Remove spark plugs using Spark Plug Removal Tool 3122B .

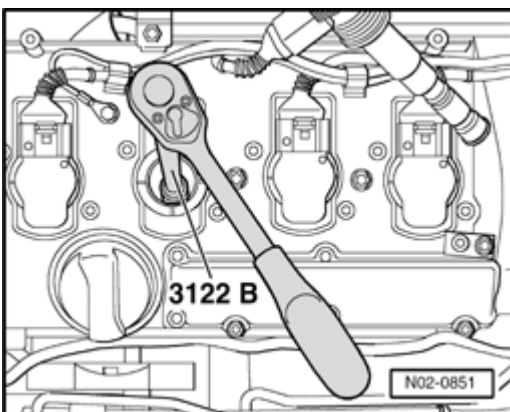
**Note:**

- *Spark plug identification and tightening torque,*

⇒ *Repair Manual, 2.0 Liter 4-Cyl. 4V Turbo Engine Mechanical, Fuel Injection Ignition, Engine Code(s): BPY, Repair Group 28,*

- *Observe disposal regulations!*

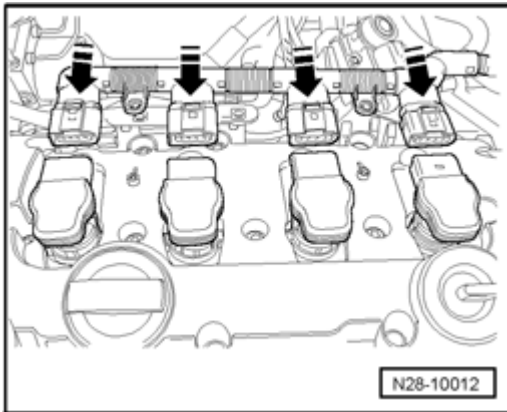
**Installing**



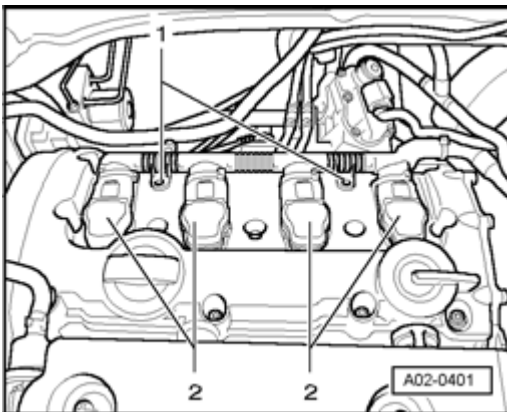
- Thread in new spark plugs using Spark Plug Removal Tool 3122B .

- Guide ignition coils with power output stage into cylinder head.

- Align ignition coils with power output stage into designated recesses of cylinder head cover.



- Connect all connectors to ignition coils - **arrows** - .
- Press ignition coils with power output stage onto spark plugs by hand until stop. They must engage noticeably.



- Secure wire routing using bolts - **1** - .
- Install engine cover.

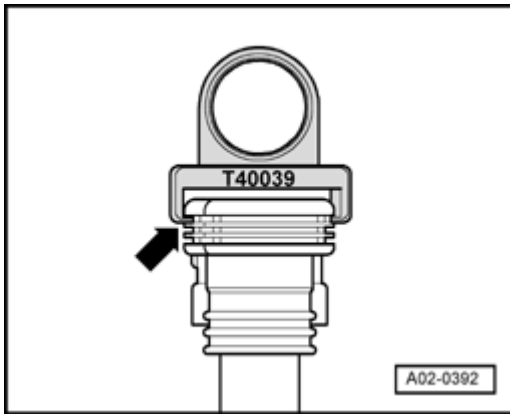
#### Replacing spark plugs, 2.5 L fuel injected engine

##### **Caution!**

- **When replacing spark plugs for the first time, make sure flange bolts of intake manifold connection are retightened to tightening torque, ⇒ [01-5, Intake manifold bolts, tightening flange bolts to tightening torque \(2.5L 5-cyl. fuel injected engine\)](#) .**

#### Removing:

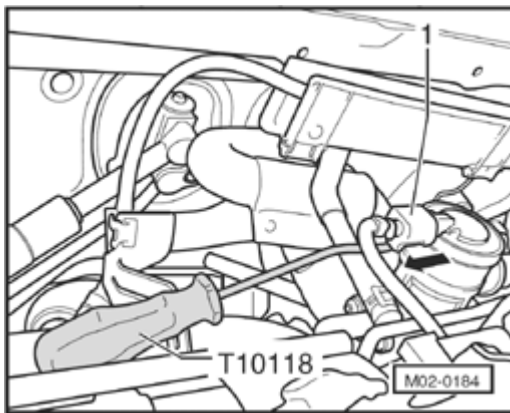
##### **Note:**



- To remove spark plugs, position Ignition Coil Puller T40039 at uppermost rib - **arrow** - of ignition coil with power output stage.
- If lower ribs are used, ribs could be damaged.

- Remove engine cover, ⇒ [01-4, Upper engine cover, removing and installing](#) .

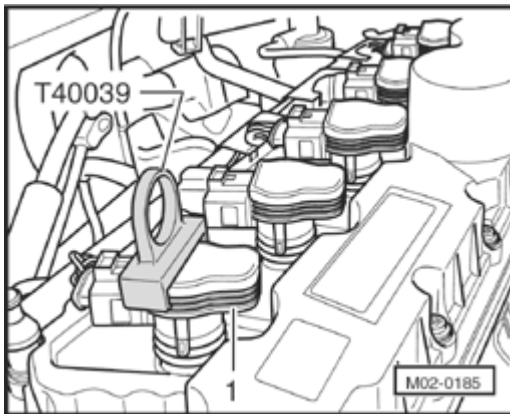
Spark plugs are located beneath ignition coils with power output stage.



- Disconnect connector - **1** - using Assembly Tool T10118 in direction of arrow.

**Note:**

- Disconnecting connector is necessary in order to lay aside ignition coils with power output stage, including connected cables and wiring!



- Remove all ignition coils with power output stage - 1 - upward using Ignition Coil Puller T40039 .

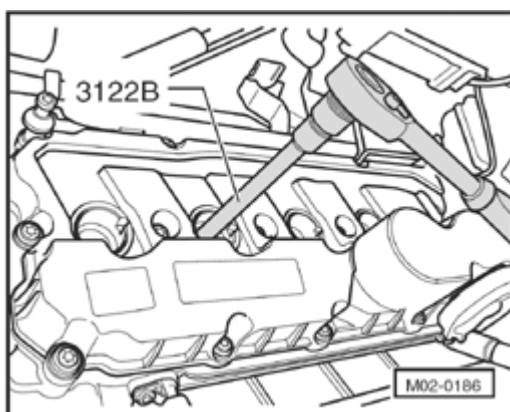
**Note:**

- *When removing ignition coils with power output stage, wires and ignition coil connectors may remain connected.*
- *Note installation position of ignition coils with power output stage!*

- Carefully lay aside ignition coils with power output stage and connected wires.

**Caution!**

***Make sure wires are not kinked or damaged.***



- Remove spark plugs using Spark Plug Removal Tool 3122B .

**Installing**

- Thread in new spark plugs using Spark Plug Removal Tool 3122B and tighten to 20 Nm.

- Guide ignition coils with power output stage into cylinder head and align ignition coils to designated recesses in cylinder head cover.
- Press ignition coils with power output stage onto spark plugs until stop, they must engage noticeably.
- Connect connector onto exhaust gas recirculation valve until it engages noticeably.

**Note:**

- *Make sure that wiring of ignition coils with power output stage is routed properly.*

- Install engine cover ⇒ [01-4, Upper engine cover, removing and installing](#) .