

print



### WARNUNG

**Gefahr des Verlusts der Text-Bild-Zuordnung beim Ausdruck.**

- **Aus technischen Gründen kann derzeit nicht ausgeschlossen werden, dass trotz einwandfreier Darstellung auf dem Bildschirm beim Ausdruck der Zusammenhang von Text und zugehörigem Bild verloren geht.**
- **Wird der Fehler nicht bemerkt, besteht die Gefahr, daß Arbeiten nicht korrekt durchgeführt werden und es dadurch zu Personen- und Sachschäden kommt.**

→ Vergleichen Sie deshalb nach dem Druckvorgang unbedingt die Ausdrucke mit der Bildschirmdarstellung. Korrigieren Sie die Ausdrucke im Fehlerfall so, daß der Inhalt der Bildschirmdarstellung zutreffend wiedergegeben wird.



### WARNING

**Danger of losing text-figure correspondence when printing out.**

- **For technical reasons, it can currently not be ruled out that the correspondence between text and associated figure can be lost when it is printed out, even though the display on the screen is correct.**
- **If the fault is not noticed, there is the danger that work will not be performed correctly which can cause injury and damage.**

→ Therefore, always compare printouts with the screen display after printing them out. Correct the printouts if they are faulty so that the content of the screen display matches that on the printouts.



### AVERTISSEMENT

**Risque de perte de la correspondance texte-illustration lors de l'impression papier.**

- **Pour des raisons techniques, il ne peut pas être exclu à l'heure actuelle que, même en cas d'affichage correct à l'écran, la correspondance entre le texte et l'illustration puisse être erronée sur l'impression papier.**
- **Si l'erreur passe inaperçue, on court le risque d'exécuter certaines opérations de manière incorrecte pouvant conduire à des dommages corporels et matériels.**

→ Comparez impérativement pour cette raison les impressions papier avec l'affichage à l'écran. Corrigez-les en cas d'erreur de manière à reproduire correctement l'affichage à l'écran.



### ATTENZIONE

**Pericolo di perdita dell'abbinamento testo-immagine nella stampa.**

- **Per motivi tecnici non è escluso che, nonostante la rappresentazione sullo schermo risulti perfetta, durante la stampa venga persa la corrispondenza fra testo e relativa immagine.**
- **Se tale difetto non viene rilevato vi è il pericolo che i lavori non siano eseguiti correttamente; ciò può avere come conseguenza lesioni e danneggiamenti.**

→ Per questo motivo, dopo la stampa è assolutamente necessario confrontare le stampe con la rappresentazione sullo schermo. In caso di errore si prega di correggere le stampe, così da garantire la riproduzione esatta della rappresentazione sullo schermo.



### ADVERTENCIA

**Al imprimir se corre el riesgo de perder la correcta asignación de las figuras al texto.**

- **Por motivos técnicos, por el momento no se puede descartar que, aun siendo correcta la**

imagen que aparezca en la pantalla, al imprimir se pierda la correlación entre el texto y la figura correspondiente.

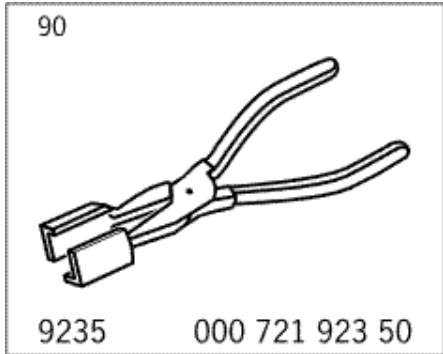
- Si este error pasara desapercibido, existe el riesgo de que los trabajos no se ejecuten de forma correcta y, por tanto, se produzcan daños personales y materiales.

→ Por ello le rogamos que tras el proceso de impresión compare siempre las copias impresas con la imagen de la pantalla. En caso de error, corrija las copias impresas de forma que se correspondan con el contenido de la imagen de la pantalla.

## 15 37 19 Removing and installing solenoid/hydraulic valve for camshaft adjuster - as of MY 2004

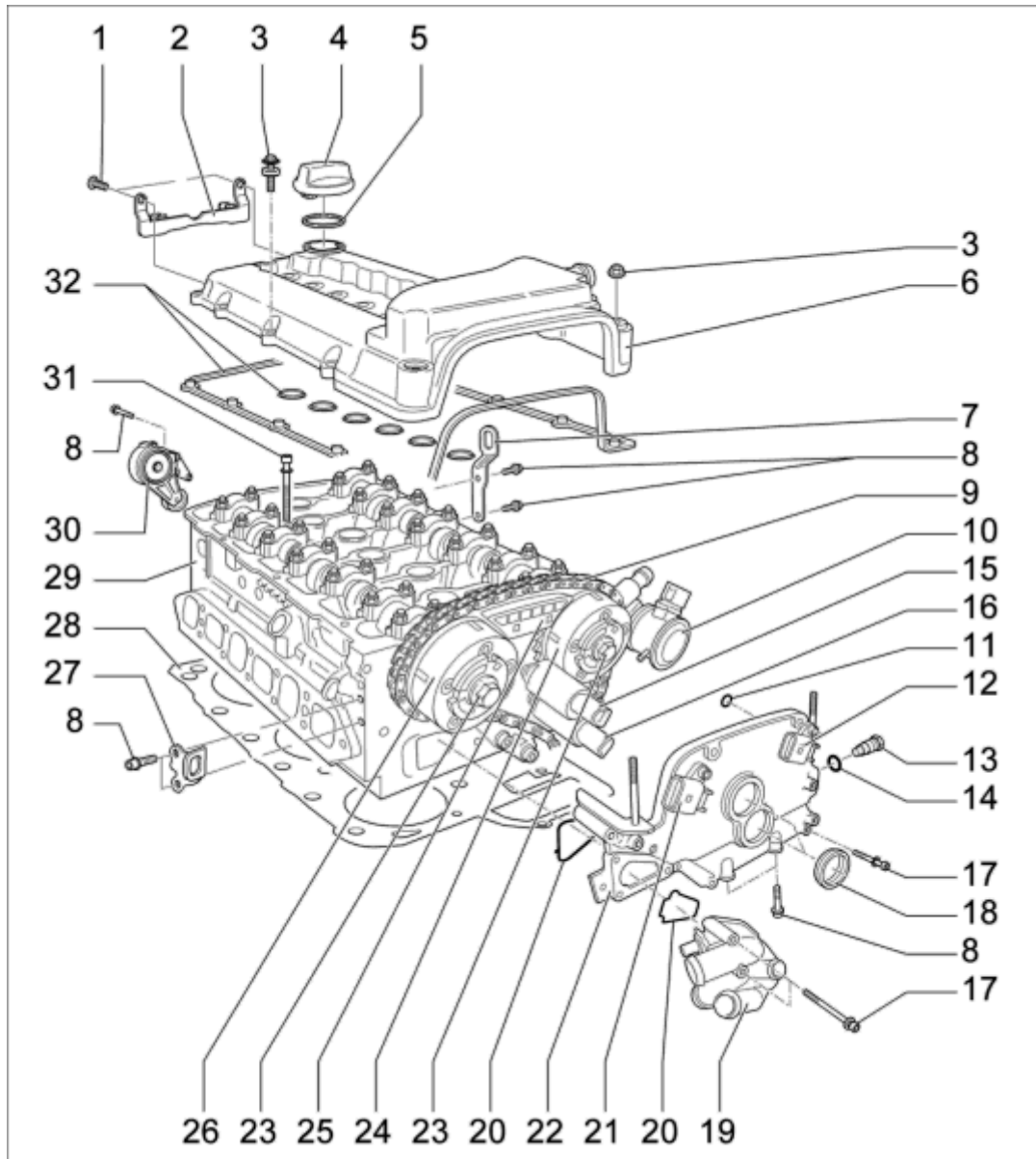
- [Information](#)
- [Tools and materials](#)
- [Removing solenoid/hydraulic valve for camshaft adjuster](#)
- [Installing solenoid/hydraulic valve for camshaft adjuster](#)

### Tools

Designation	Type	Number	Explanation	
Relay puller	special tool	9235		

### Information

### Component overview



*Component overview of cylinder head*

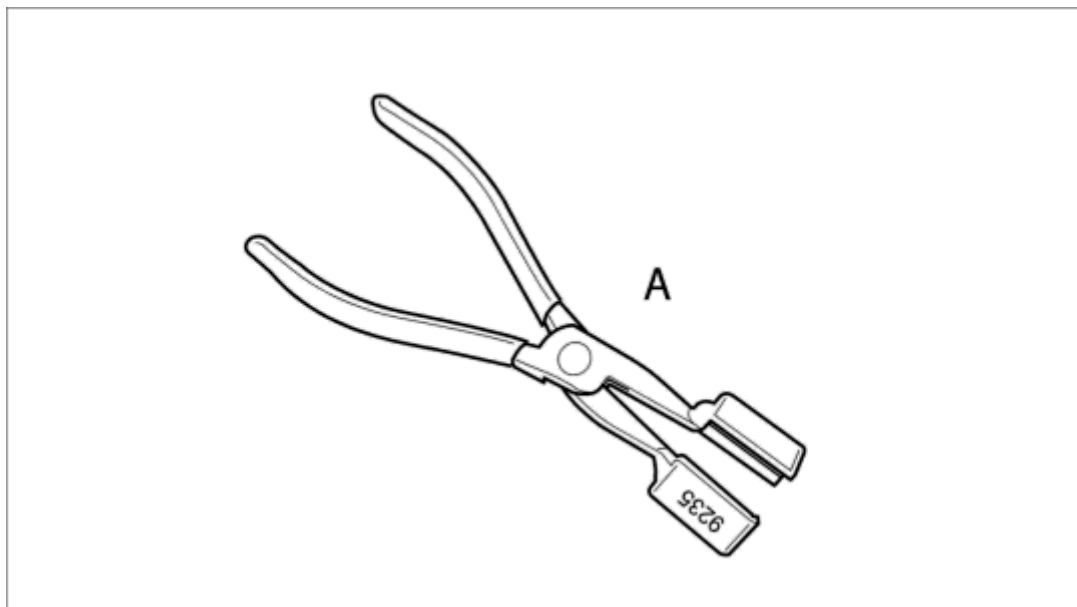
- 1- - → **Tightening torque: 7.5 ftlb.**
- 2- - Sheetmetal bracket for wiring harness
- 3- - → **Tightening torque: 7.5 ftlb.** ; check sealing ring and replace if necessary
- 3- - → **Tightening torque: 7.5 ftlb.**
- 4- - Cap
- 5- - Sealing ring; check and replace if necessary
- 6- - Cylinder head cover
- 7- - Suspension eye
- 8- - → **Tightening torque: 17 ftlb.**
- 9- - Camshaft roller-type chain; maintain rolling direction; set the timing → 150516 Setting the timing for camshafts
- 10- - Combination valve for secondary air system
- 11- - Sealing ring; replace and oil before use
- 12- - → **Tightening torque: 6 ftlb.** ; mark cable plug before removal
- 13- - → **Tightening torque: 30 ftlb.** ; replace sealing ring
- 14- - Sealing ring; replace
- 15- - → **Tightening torque: 4.5 ftlb.** ; mark cable plug before removal; note colour of hydraulic valve and

installation position (black)

- 16- - → **Tightening torque: 4.5 ftlb.** ; mark cable plug before removal; note colour of hydraulic valve and installation position (brown)
- 17- - → **Tightening torque: 6 ftlb.**
- 18- - Sealing ring
- 19- - Coolant regulator housing; replace seal
- 20- - Sealing ring; replace
- 21- - → **Tightening torque: 6 ftlb.** ; mark cable plug before removal
- 22- - Top chain case lid
- 23- - → **Tightening torque: 44 ftlb.** → **Torque angle: 90 °**
- 24- - Outlet camshaft adjuster 32A
- 25- - Guide rail, clip in
- 26- - Inlet camshaft adjuster 24E
- 27- - Suspension eye
- 28- - Cylinder-head gasket; replace; change coolant
- 29- - Cylinder head; clean sealing faces; check for distortion; change coolant
- 30- - Tensioning element
- 31- - → **Initial tightening: 22 ftlb.** → **Final tightening: 37 ftlb.** → **Torque angle: 180 °** ; replace; oil; long screws in the middle
- 32- - Cylinder head cover seals; observe installation position; check and replace if necessary

## Tools and materials

### Tools and materials



*Relay puller*

Item	Designation	Source	Explanation
-A-	Relay puller 9235	→ "See Workshop Equipment Manual, Chapter 2.2.2 or 2.2.1"	Used to carefully grip relays and valves.

## Removing solenoid/hydraulic valve for camshaft adjuster

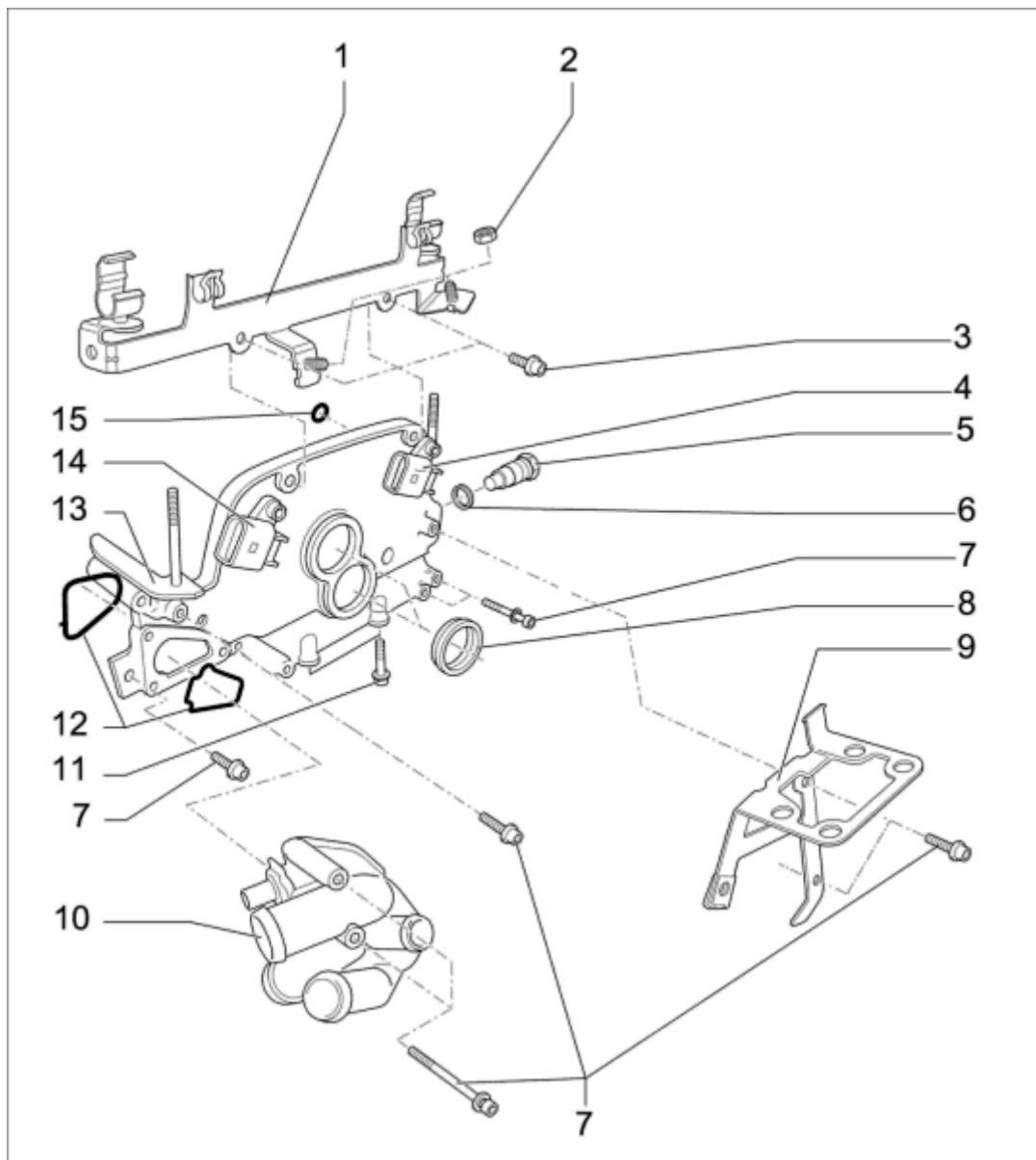
### Removing solenoid/hydraulic valve for camshaft adjuster



#### Note

- Observe the most important working regulations and warning notes → The most important working regulations and warning notes .

1. Remove top chain case lid. → 153321 Removing chain case lid

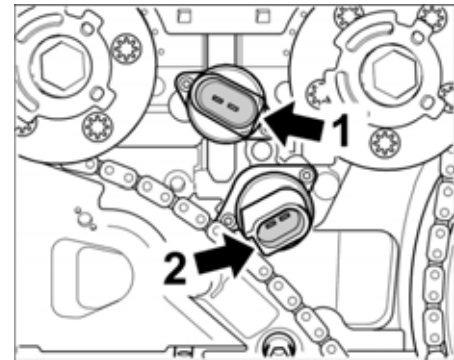


View of top chain case lid



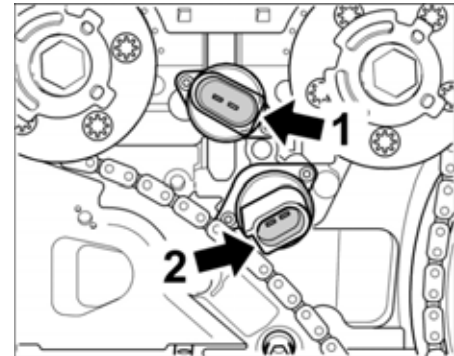
#### Note

- Note colour of cable plug and installation position of each hydraulic valve (black connection at top outlet side -1-, brown connection at bottom inlet side -2-).



Hydraulic valves

- The cornered edges of the hydraulic valves are facing each other **-1 and 2-**.
2. Unscrew the four M5 x 10 fastening screws for the hydraulic valves and carefully remove the hydraulic valves using the **relay puller 9235**.
  3. Check sealing rings of the hydraulic valves for damage and replace hydraulic valves if necessary.



Hydraulic valves

## Installing solenoid/hydraulic valve for camshaft adjuster

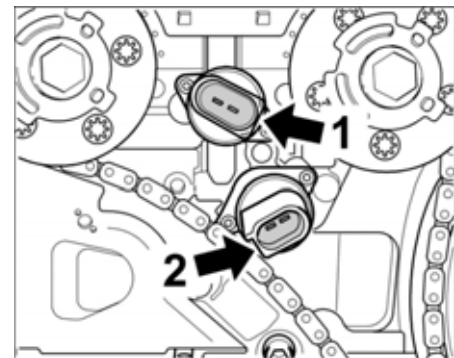
### Installing solenoid/hydraulic valve for camshaft adjuster

1. Check sealing rings of the hydraulic valves for damage and replace hydraulic valves if necessary.
2. Oil the sealing rings of the hydraulic valves with engine oil.



#### Note

- Note colour of cable plug and installation position of each hydraulic valve (black connection at top outlet side **-1-**, brown connection at bottom inlet side **-2-**).



Hydraulic valves

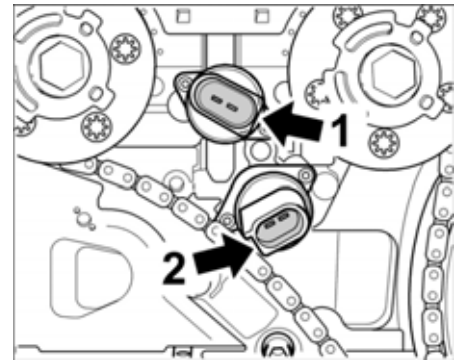
- The cornered edges of the hydraulic valves are facing each other **-1 and 2-**.
3. Insert hydraulic valves carefully into the timing chain housing with rotating movements. Align hydraulic valves according to removal position.
  4. Tighten fastening screws. → **Tightening torque: 4.5 ftlb.**



#### Note

- Check sealing rings on top chain case lid and replace if necessary.

5. Install top chain case lid. → 153323 Installing chain case lid



*Hydraulic valves*

9PAAD1, 9PAAD7

as of MY 2004

Country C00, C02, C05, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C32, C33, C34, C35, C36, C37, C38, C39, C45, C46, C98, C99