

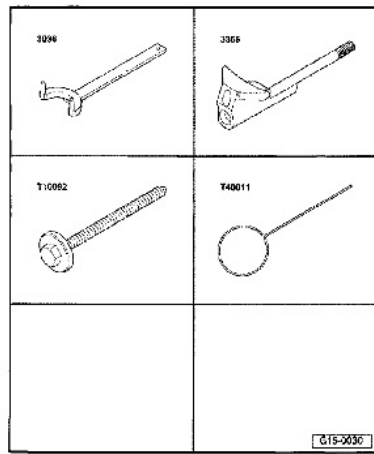
2005 Volkswagen PASSAT

Submodel: | Engine Type: L4 | Liters: 1.8

Fuel Delivery: FI | Fuel: GAS

1.8L Turbo-Engine

Four cylinder special tools for camshafts



- Holding tool 3036 or equivalent
- Retainer for chain tensioner 3366 or equivalent
- Tensioning screw T10092 or equivalent
- Guide pin T40011 or equivalent

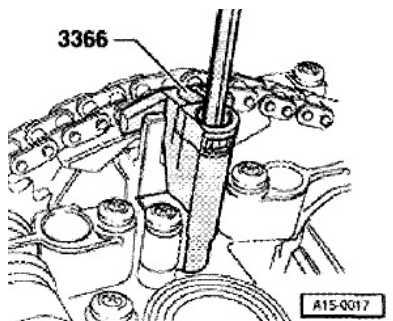
To Remove:

1. Before servicing the vehicle refer to the precautions at the beginning of this section.
2. Disconnect the negative battery cable.
3. Lock carrier in service position.
4. Remove or disconnect the following:
 - Toothed belt from camshaft sprocket
 - Engine cover
 - Secondary air combination valve
 - Connector at camshaft adjuster
 - Cylinder head cover
 - Camshaft sprocket bolt (counter-hold with 3036 or equivalent).
 - Cam shaft sprocket
 - Hall sensor

CAUTION

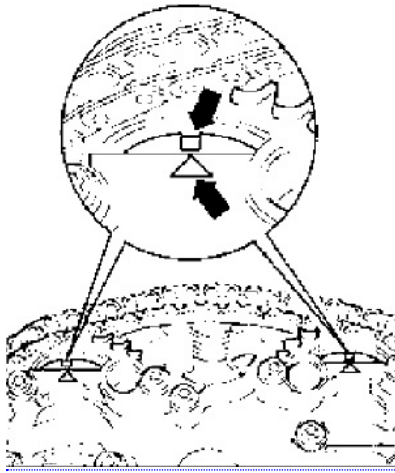
Excessive tightening of chain tensioner holder can damage camshaft adjuster.

Camshaft chain tensioner holder installed



5. Secure camshaft adjuster with chain tensioner holder 3366 or equivalent.

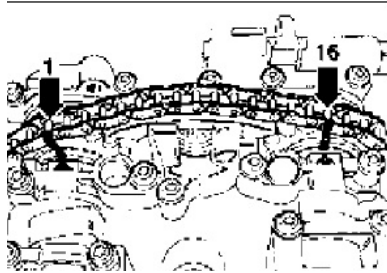
Camshafts at TDC



6. Re-check TDC position of camshafts:

- o Mark on the two camshafts must be in line with arrows on bearing caps
- o Clean chain and camshaft sprockets opposite two arrows on bearing caps and mark installation position using colored markings
- o The distance between the two arrows or between colored markings is 16 rollers on the drive chain

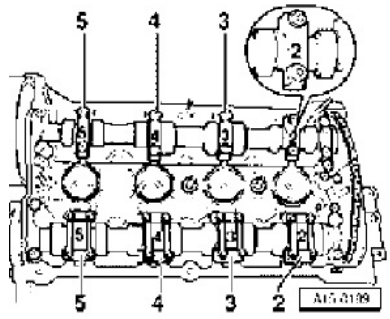
Distance between the colored markings



- o The notch on exhaust camshaft is offset slightly toward inside in relation to chain roller A

Note: Do not mark chain with a center punch or by making a notch, etc.

Four cylinder camshaft bearing cap ID

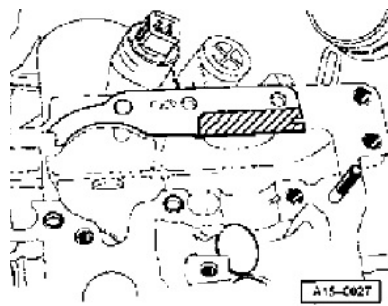


7. Remove or disconnect the following:

- o Bearing caps three and five on intake and exhaust camshafts
 - o Double bearing cap
 - o Both bearing caps on intake and exhaust camshaft chain sprockets
 - o Bolts securing camshaft adjuster
8. Loosen bearing caps two and four of intake and exhaust camshafts alternately in diagonal sequence and remove.
9. Remove intake and exhaust camshafts together with camshaft adjuster.

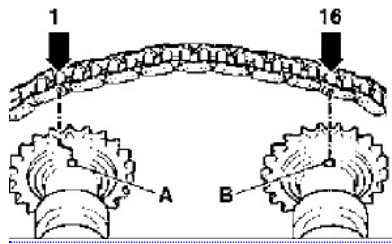
To Install:

Sealant location



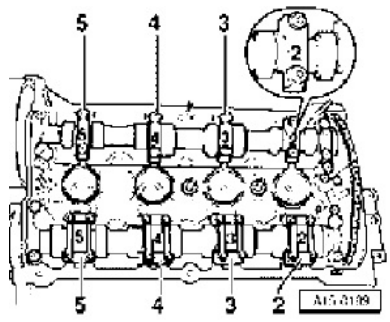
1. Replace rubber/metal gasket for camshaft adjuster and apply a thin coat of sealant to shaded areas as shown in illustration
2. Install drive chain on camshaft sprockets as follows:
 - If old chain is used install chain so that colored markings are in line with notches

New chain position



- If new chain is used distance between notches one and two on camshafts must be 16 rollers on chain. Illustration shows exact positions of 1st and 16th rollers on sprockets
 - The notch one is offset slightly toward inside in relation to chain roller A
 - Insert camshaft adjuster between drive chain (two technicians are needed).
 - Locate camshafts together with drive chain and camshaft adjuster in cylinder head
 - Oil camshaft journal surface
 - Dowel sleeves for bearing caps and camshaft adjuster must be installed in cylinder head
3. When installing bearing caps ensure that identification mark is readable from intake side of cylinder head.
 4. Torque camshaft adjuster bolts to **89 inch. lbs. (10 Nm)**. Watch position of dowel sleeves.

Four cylinder camshaft bearing cap ID



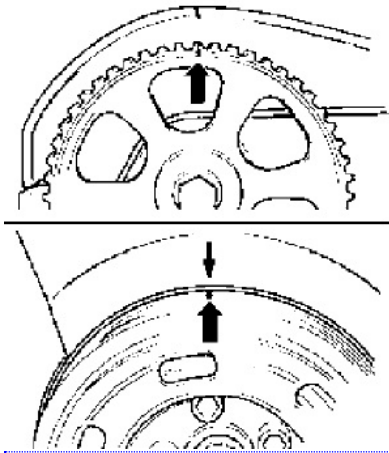
5. Torque bearing caps two and four of intake and exhaust camshafts alternately in diagonal sequence to **89 inch. lbs. (10 Nm)**. Watch position of dowel sleeves.
6. Install both bearing caps on intake and exhaust camshaft chain sprockets.
7. Check correct setting of camshafts:
 - The two markings on camshafts must be in line with the two arrows on bearing caps
 - The distance between the two arrows on bearing caps or between colored markings is 16 rollers on the drive chain
 - The notch on exhaust camshaft is offset slightly toward inside in relation to chain roller A
8. Remove chain tensioner holder 3366.

Sealant location on double bearing cap



9. Apply thin coat of sealant to shaded area on double bearing cap.
10. Install double bearing cap; torque bolts to **89 inch. lbs. (10 Nm)**. Watch position of dowel sleeves.
11. Install or connect the following:
 - Remaining bearing caps; torque bolts to **89 inch. lbs. (10 Nm)**. Watch position of dowel sleeves
 - Oil seals for intake and exhaust camshafts
 - **Note:** Narrow web of camshaft sprocket must face outward and marking for TDC No. 1 cylinder must be visible from front.
 - Camshaft sprocket
 - Bolt for camshaft sprocket; torque to **48 lb-ft. (65 Nm)**. Use Counterhold 3036 or equivalent
 - Hall sensor; torque rotor ring to **18 lb-ft. (25 Nm)** and housing to **89 inch. lbs. (10 Nm)**
 - Cylinder head cover

Set crankshaft and camshaft to TDC No. 1 cylinder



12. Align marking on camshaft sprocket with marking on cylinder head cover.
13. Align marking on vibration damper with marking on bottom section of toothed belt guard.

CAUTION

The crankshaft must not be at TDC when camshaft is rotated. Otherwise there is a risk of damage to valves and piston crowns.

14. Install toothed belt.

Note: After installing camshafts, engine must not be started for approximately 30 minutes. Hydraulic valve compensation elements have to settle (otherwise valves will strike pistons). After working on valve gear, rotate crankshaft carefully at least two rotations, to ensure that none of the valves make contact when starter is operated.