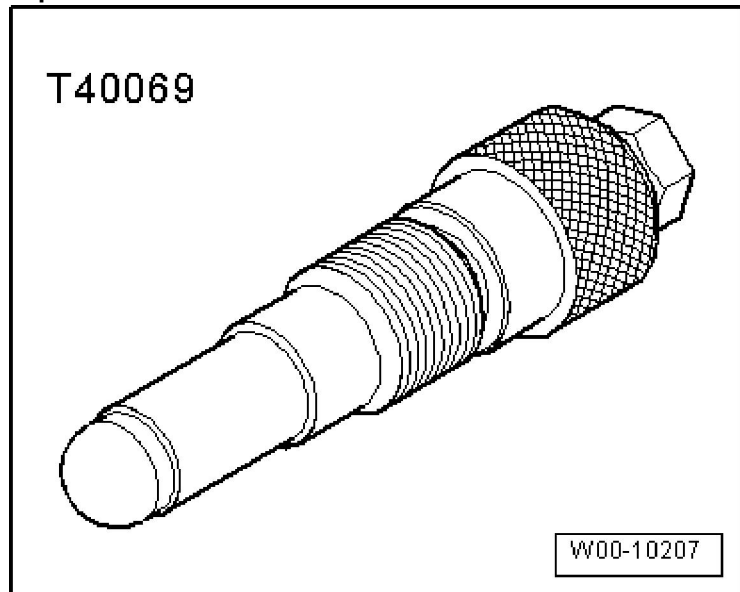


Cylinder head, removing and installing

Special tools and workshop equipment required

- ◆ Locking pin -T40069-



- ◆ Camshaft Clamp -T40070-
Removing

- Engine installed.



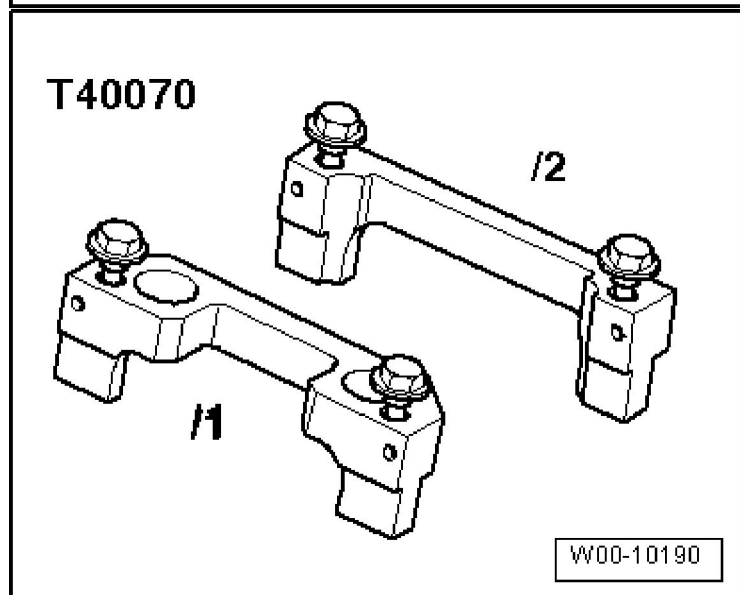
Note

The following removal and installation procedure is for the left cylinder head. The procedure for the other side is identical.



WARNING

Fuel system is under high pressure!
Before opening high pressure components of the fuel injection system, pressure must be relieved to residual pressure → Chapter. Then wrap a clean rag around the connection and relieve residual pressure by carefully loosening the connection.



- Drain coolant → Chapter.
- Remove front exhaust pipe: Left → Chapter, right → Chapter.
- Remove ribbed belt → Chapter
- Remove front coolant pipe → Chapter.
- Remove power steering pump → Rep. Gr.48.

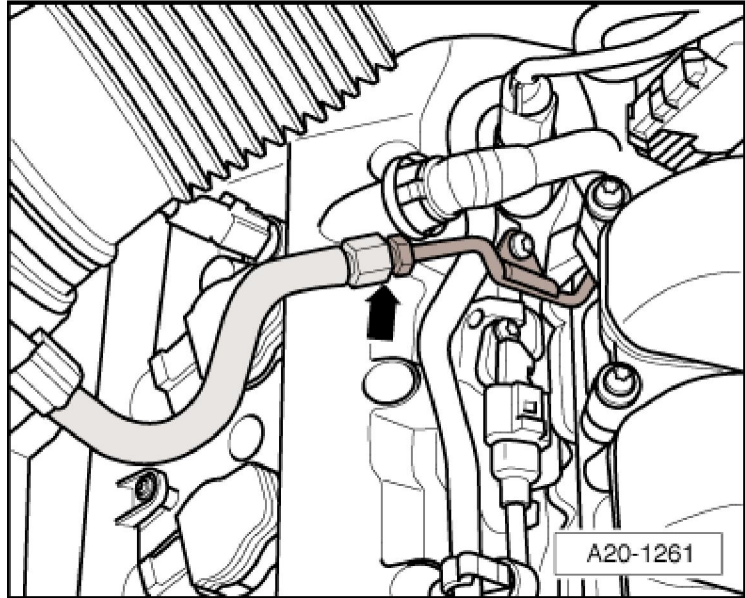


Note

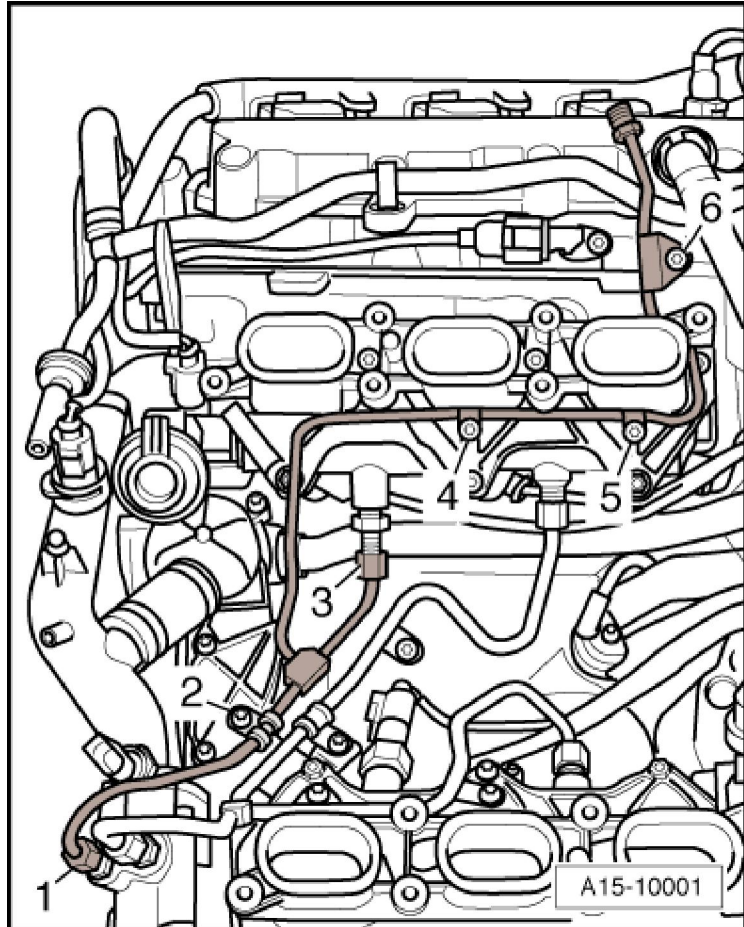
To remove the right cylinder head, the vacuum pump for brake booster must be removed → Chapter.

- Remove upper part of intake manifold

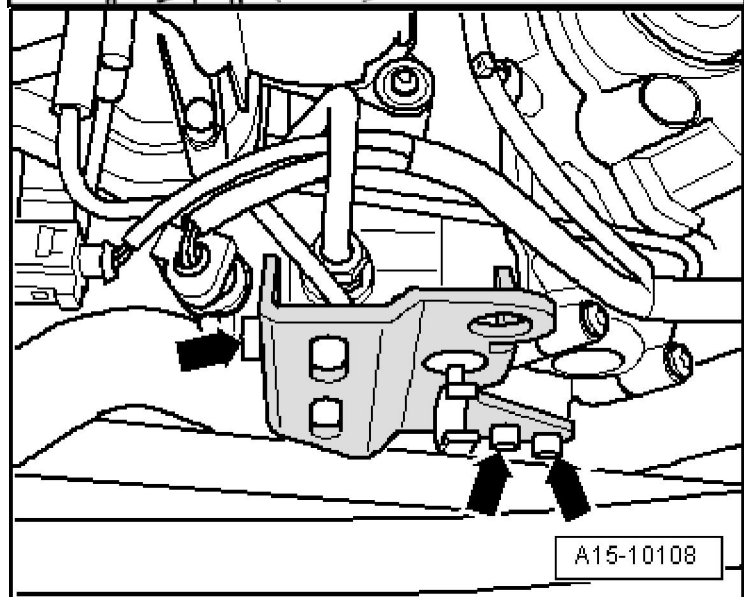
- Rep. Gr.24.
- Remove intake manifold lower part
→ Rep. Gr.24.
- Disconnect electrical harness
connectors at fuel injectors.
- Remove oil filter housing → Chapter.
- Disconnect fuel line -arrow-.



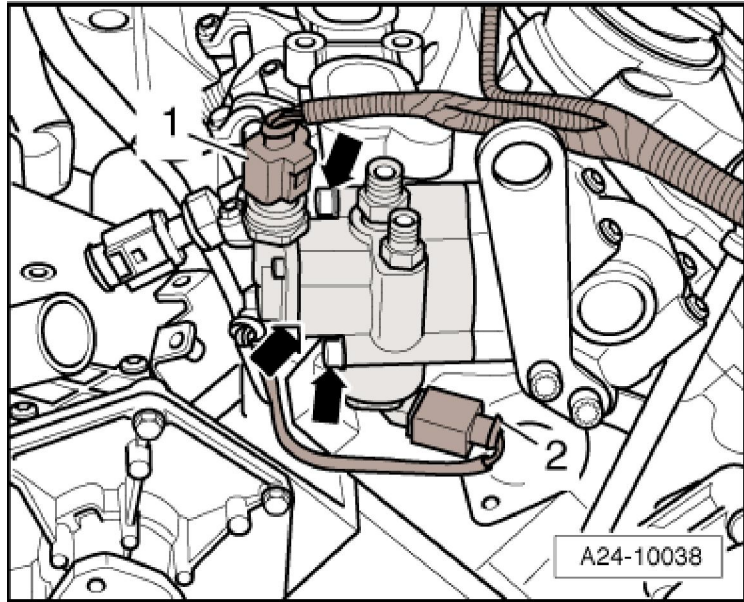
- Remove low pressure line, thereby removing bolts and union nuts -1 through 6-



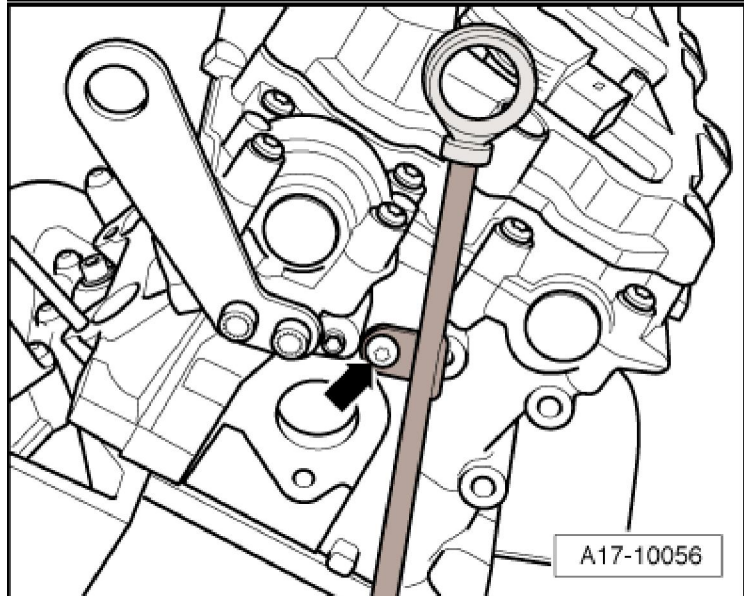
- If equipped, remove large lifting eye - arrows-



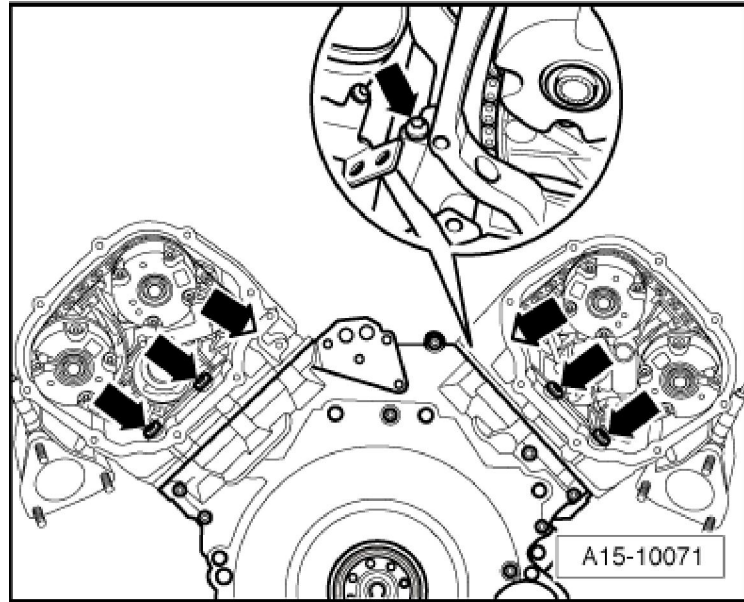
- Disconnect electrical connectors -1- and -2-.
- If necessary, remove high pressure pump from left cylinder head -arrows-.



- Remove bolt -arrow- and pull oil dipstick guide tube upward and out.
- Remove cylinder head cover: Left → Chapter, right → Chapter.
- Remove left and right timing chain covers → Chapter.
- Remove camshaft timing chains from camshafts → Chapter.



- Remove bolts -arrows- at rear of cylinder head.
- ◆ Left cylinder head: 3 bolts.
- ◆ Right cylinder head: 4 bolts.



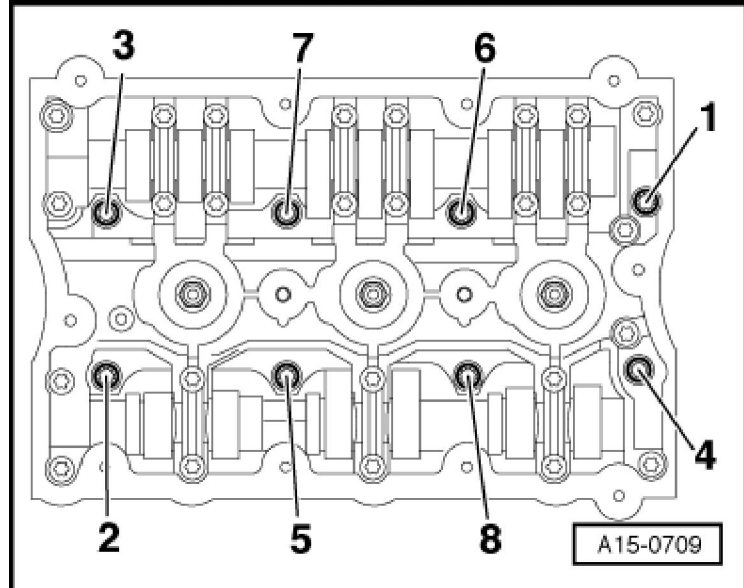
- Follow sequence -1 to 8- when loosening cylinder head bolts.
- Carefully remove cylinder head.

Installing



Note

- ◆ Replace cylinder head bolts.
- ◆ During assembly, replace self-locking nuts and bolts.
- ◆ Always replace bolts that are tightened to torque as well as O-rings and gaskets.
- ◆ Carefully remove residual sealant from cylinder head and cylinder block.
- ◆ Make sure that no long scrapes or scratches result.
- ◆ Carefully remove all grinding and sanding residue.
- ◆ There must be no oil or coolant in the blind holes for the cylinder head bolts in the cylinder block.
- ◆ Checking cylinder head for distortion → Fig.
- ◆ Only unpack new cylinder head gasket immediately prior to installation.
- ◆ Handle gasket carefully. Damage in silicon layer and recessed area lead to leakage.
- ◆ Install cylinder head gasket onto guide sleeves. Marking "oben" (top) or part number must face toward cylinder head.
- ◆ After installing a replacement cylinder head with camshafts installed, oil contact surfaces between roller cam



followers and cam lubricating surfaces after installing cylinder head.

Do not remove plastic bases protecting exposed valves until

- ◆ immediately before installing cylinder head.

When replacing cylinder head or

- ◆ cylinder head seal, coolant and engine oil must be changed.

Secure all hose connections using

- ◆ hose clamps appropriate for the model type → [Electronic Parts Catalog "ETKA"](#).

During installation, all cable ties must be re-installed at the same location.

After working on the valvetrain, carefully rotate engine by hand at

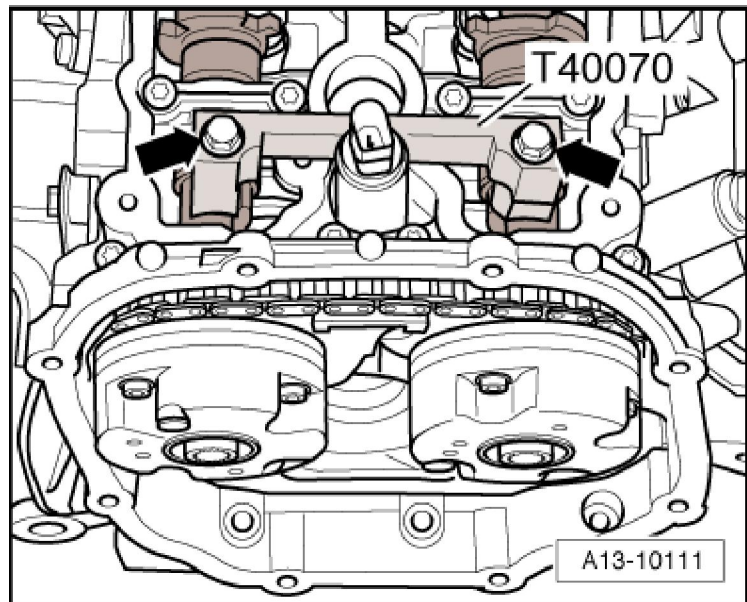
- ◆ least 2 full revolutions to ensure that valves do not strike the pistons when starting.

- ◆ Change contaminated engine oil.

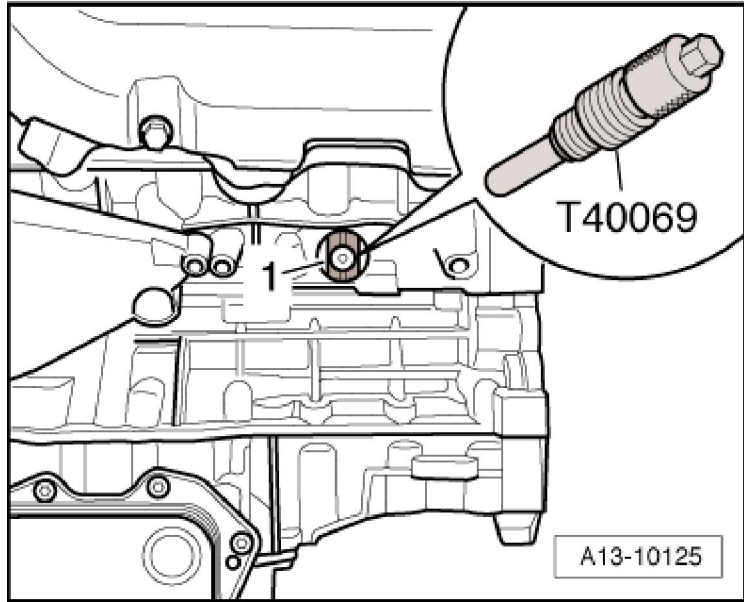
Before installing cylinder head, set crankshaft and camshafts to TDC

- setting, mounting Camshaft Clamp - T40070- on both cylinder heads and tightening to 20 Nm.

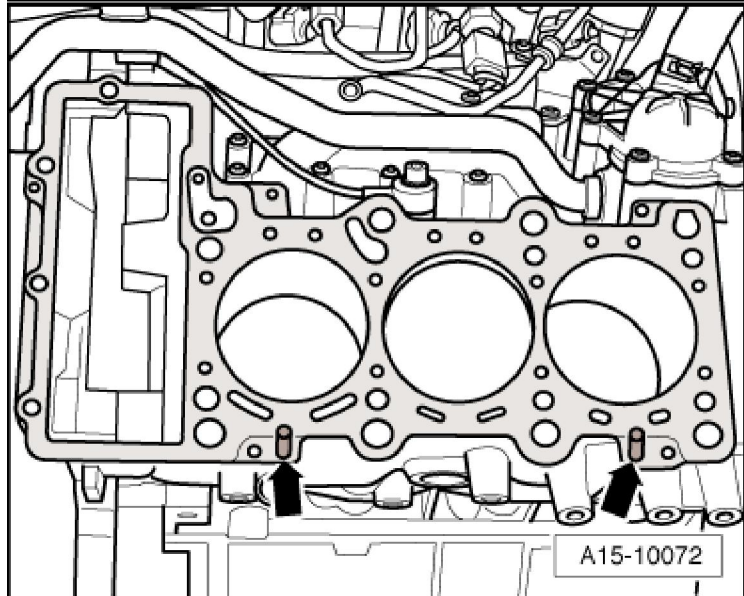
- The Camshaft Clamp -T40070- is correctly positioned when holes for cylinder head bolts remain free.



- Locking Pin -T40069- must be installed into the crankshaft.



- Position cylinder head gasket.
- Pay close attention to centering pins - arrows- in cylinder block.
- Pay attention to installation position of cylinder head gasket, marking "oben" (top) or part number must face toward cylinder head.
- Install cylinder head.

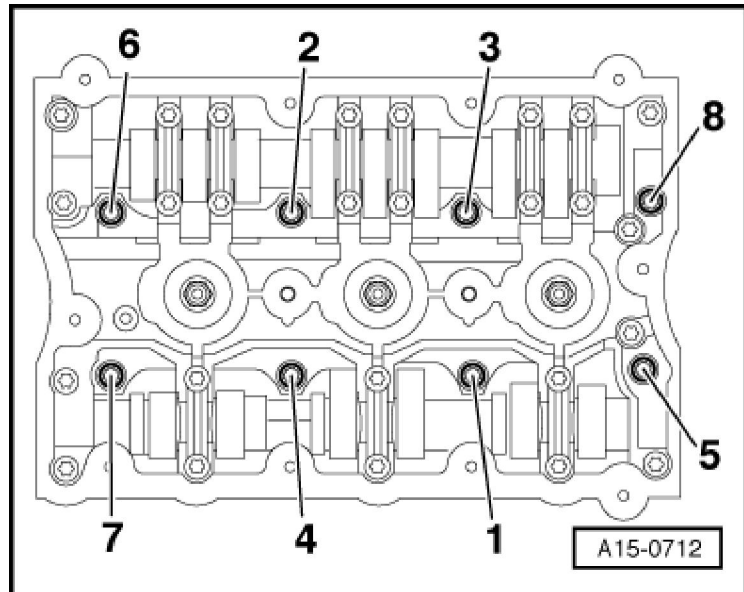


- Insert new cylinder head bolts and tighten by hand.
- Tighten cylinder head in sequence indicated, in 3 stages as follows:
 1. Using torque wrench, tighten to 40 Nm.
 2. With Torx key, 90° (1/4 turn) additional turn.
 3. With Torx key, 90° (1/4 turn) additional turn.



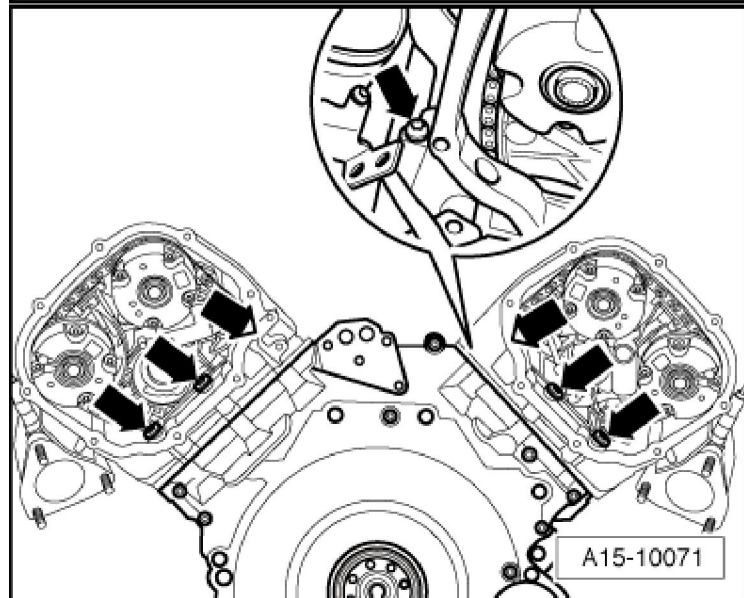
Note

There is no requirement to retighten the cylinder head bolts.



- Tighten bolts -arrows- to 9 Nm.
 - ◆ Left cylinder head: 3 bolts.
 - ◆ Right cylinder head: 4 bolts.
- Further installation is in reverse order of removal, note the following:

- Install camshaft timing chains → **Anchor**.
- Install left and right timing chain covers → **Chapter**.
- Install cylinder head cover: Left → **Chapter**, right → **Chapter**.
- Install high pressure pump → **Rep. Gr.24**.
- Install oil filter housing → **Chapter**.
- Install intake manifold lower-part with high and low-pressure lines → **Rep. Gr.24**.
- Install intake manifold upper-part → **Rep. Gr.24**.
- Install vacuum pump for brake booster → **Chapter**.
- Install power steering pump → **Rep. Gr.48**.
- Install front coolant pipe → **Chapter**.
- Install ribbed belt → **Anchor**.
- Install front exhaust pipe with catalytic converter: Left → **Chapter**; right → **Chapter**.
- Align exhaust system free of tension → **Chapter**.
- Replace engine oil → **Booklet 405**.
- Replace coolant → **Chapter**.
- Fill power steering system oil and bleed steering system → **Rep. Gr.48**.



Torque specifications

Component	Nm
Oil dip stick guide tube to cylinder head	9
Fuel hose to fuel line	22