



Cylinder head, servicing

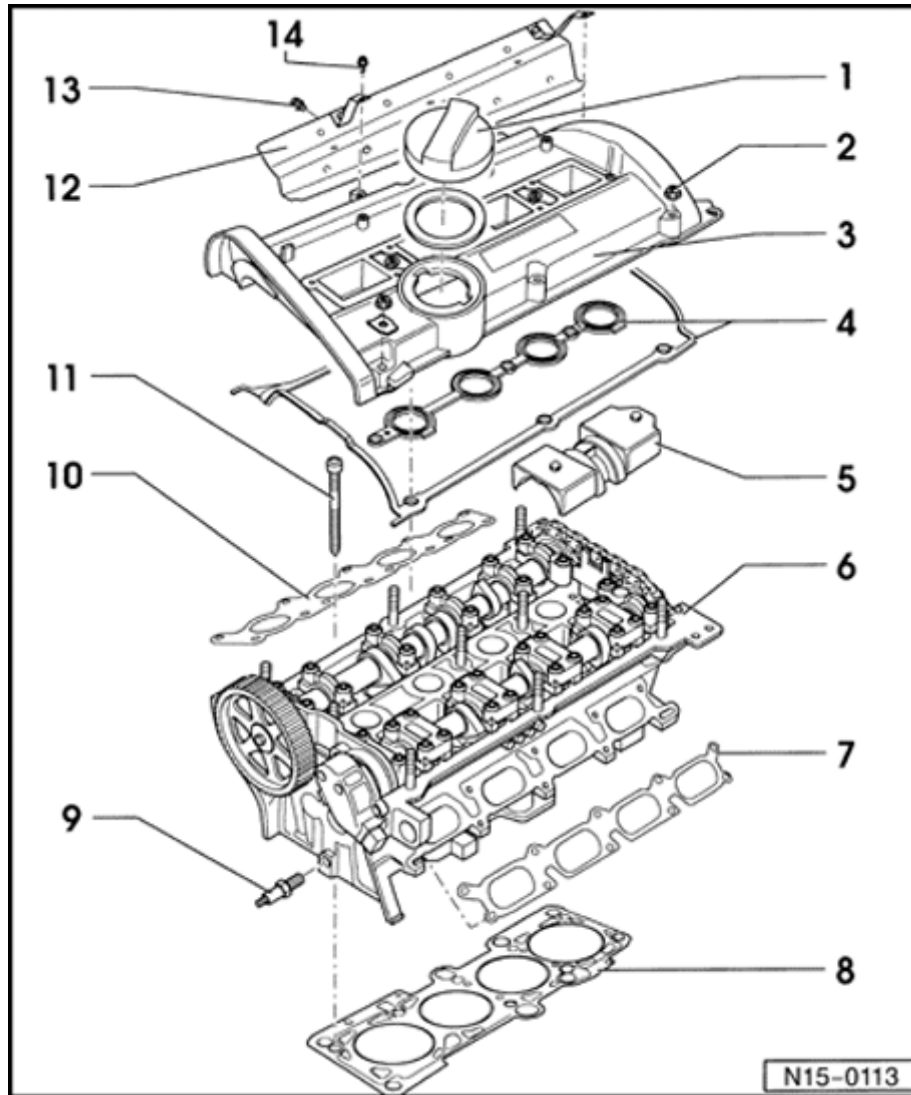
Checking compression ⇒ [Page 15-11](#)

Note:

- ◆ *When installing an exchange cylinder head (with camshaft installed), the contact surfaces between the hydraulic lifters and the cam must be oiled before installing the cylinder head cover.*

- ◆ *The plastic packing pieces for protecting the open valves must not be removed until immediately before installing the cylinder head.*

- ◆ *If the cylinder head is replaced, all the coolant in the system must also be replaced.*



1 - Cap

- ◆ Replace seal if damaged

2 - 10 Nm

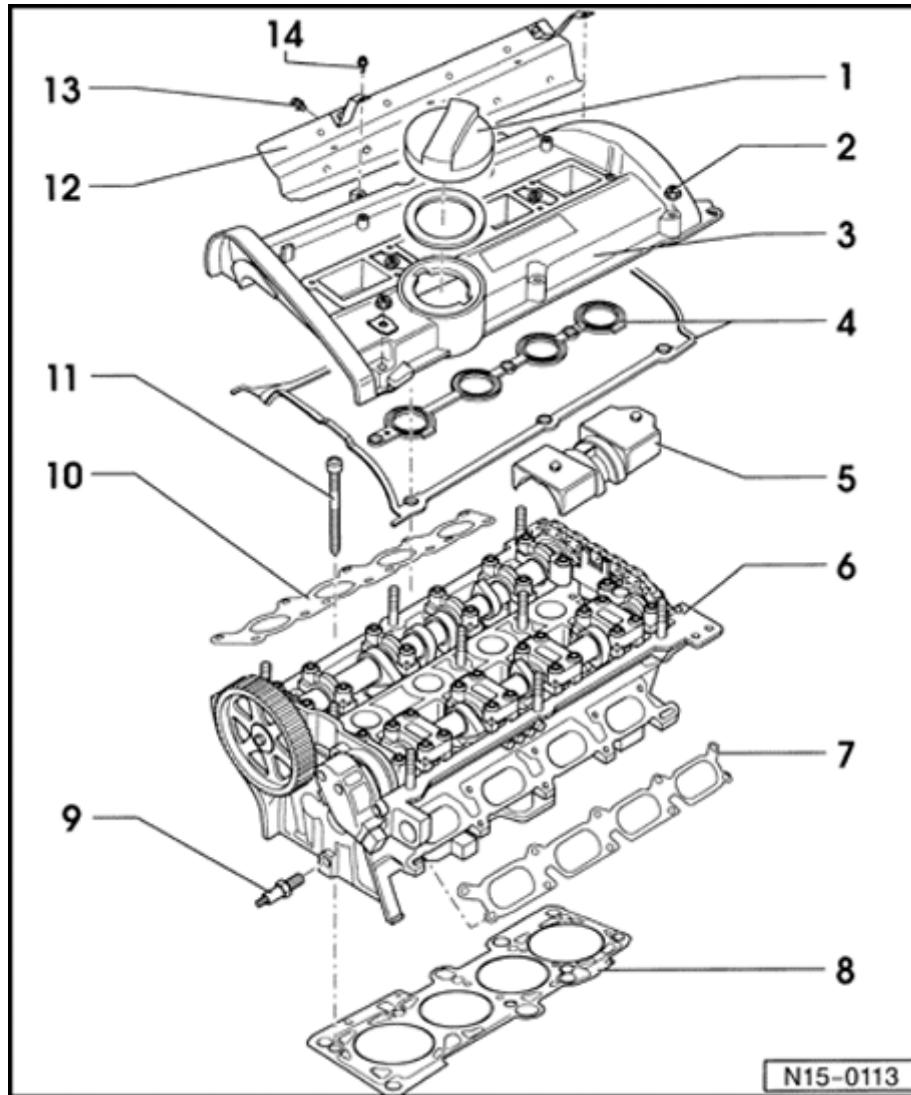
3 - Cylinder head cover

4 - Cylinder head cover gasket

- ◆ Replace if damaged
- ◆ Before installing gasket, coat transition between bearing cap/cylinder head with D 454 300 A2
- ◆ Coat half-moon shaped surface with D 454 300 A2

5 - Oil deflector

- ◆ Note installation position: Above intake camshaft between No. 1 and No. 2 cylinders



6 - Cylinder head

- ◆ Check for distortion ⇒ Fig. ⇒ [1](#)
- ◆ Reworking sealing surface ⇒ [Page 15-20](#) , Fig. ⇒ [1](#)
- ◆ Removing and installing ⇒ [Page 15-6](#)
- ◆ After replacing, completely replace engine coolant

7 - Intake manifold gasket

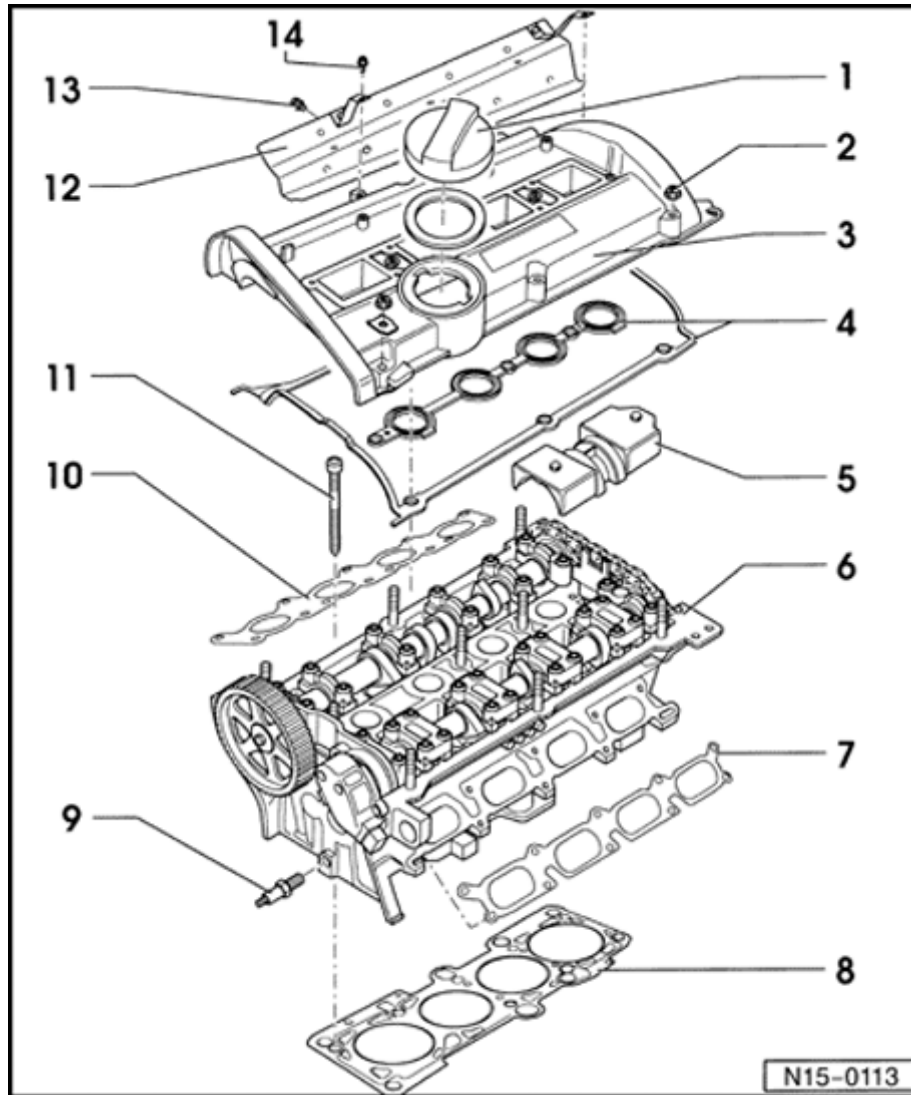
- ◆ Always replace

8 - Cylinder head gasket

- ◆ Always replace
- ◆ Metal gasket
- ◆ If replaced, completely replace engine coolant
- ◆ Note installation position: Identification: Part No. must be readable from intake side

9 - 25 Nm

- ◆ For tensioner



10 - Exhaust manifold gasket

- ◆ Always replace
- ◆ Note installation position

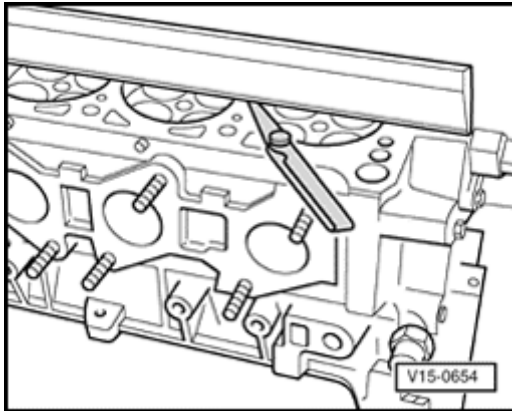
11 - Cylinder head bolt

- ◆ Always replace
- ◆ Sequence when loosening and tightening ⇒ [Page 15-6](#), Removing and installing cylinder head
- ◆ Remove and install Polydrive cylinder head bolt with 3452

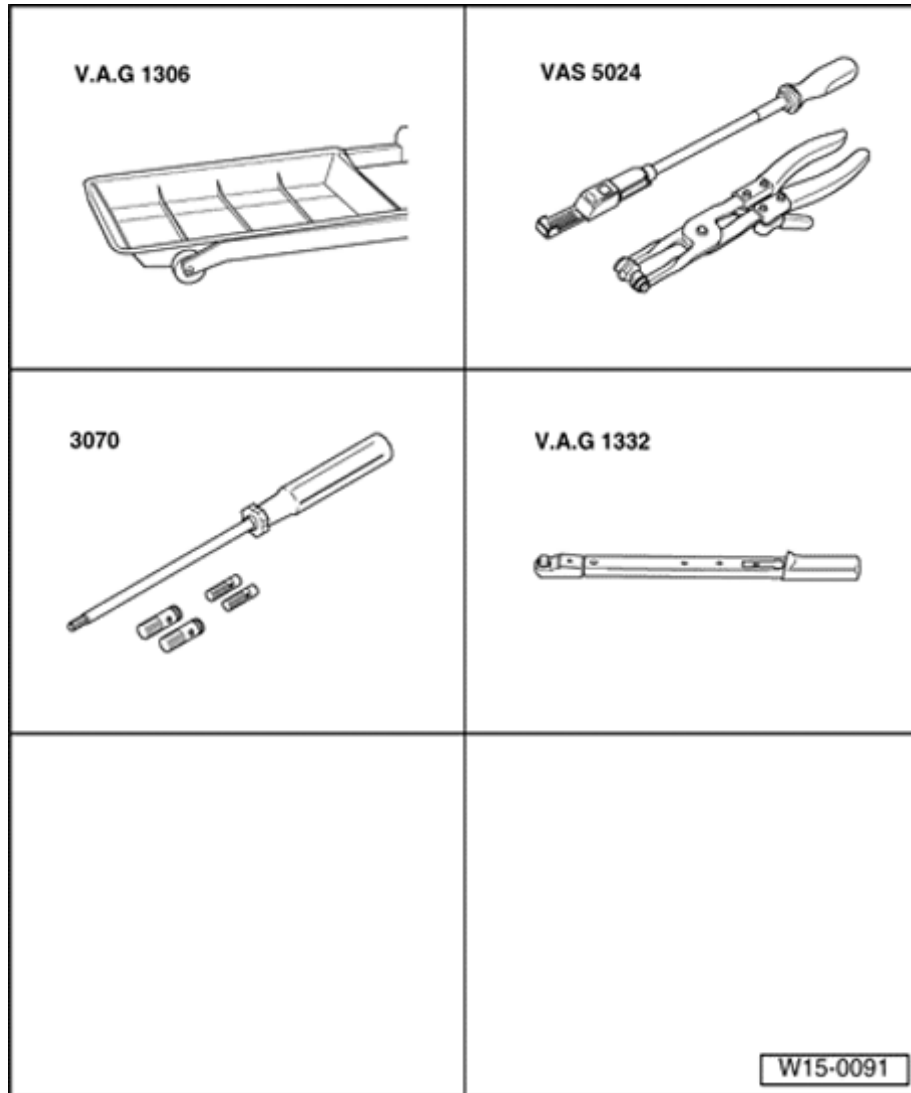
12 - Heat shield

13 - 25 Nm

14 - 10 Nm

**A****Fig. 1 Checking cylinder head for distortion**

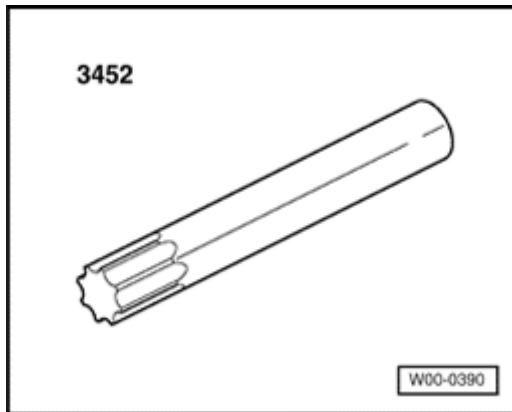
Max. permissible distortion: 0.1 mm



Cylinder head, removing and installing

Special tools and equipment

- ◆ VAG 1306 Drip tray
- ◆ VAS 5024 Spring clip pliers
- ◆ 3070 Guide pins & handle
- ◆ VAG 1332 Torque wrench (40 to 200 Nm)



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Engines with Polydrive cylinder head bolts:

- ◆ 3452 Key

Requirements

- ◆ The engine must be no more than warm to touch.
- ◆ The pistons must not be positioned at TDC.

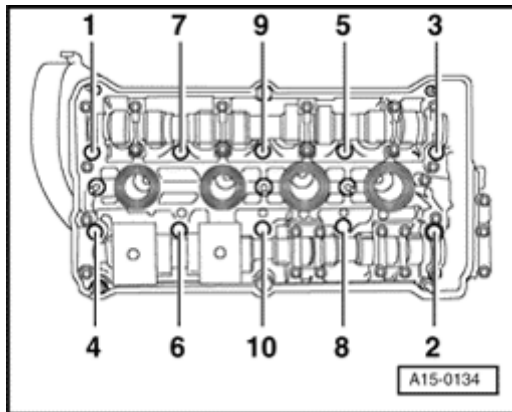
Work sequence

- Check whether a coded radio is installed. If so, obtain anti-theft coding.
- With ignition switched off disconnect battery Ground strap.
- Drain coolant ⇒ [Page 19-18](#) .
- Separate fuel supply and fuel return lines at connection on fuel rail.

Note:

The fuel system is under pressure. Place a cloth over the connection before the hoses are pulled off.

- Seal lines so that fuel system is not contaminated by dirt etc.
- Disconnect front exhaust pipe or catalyst from exhaust manifold.
- Remove toothed belt guard - upper part.



- Release tensioner and remove toothed belt from camshaft sprocket.

- Remove cylinder head cover.

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- Loosen socket head bolts in sequence given and then remove completely.

Note:

Use tool 3452 for Polydrive cylinder head bolts.

- Carefully lift off cylinder head.

Installing

Note:

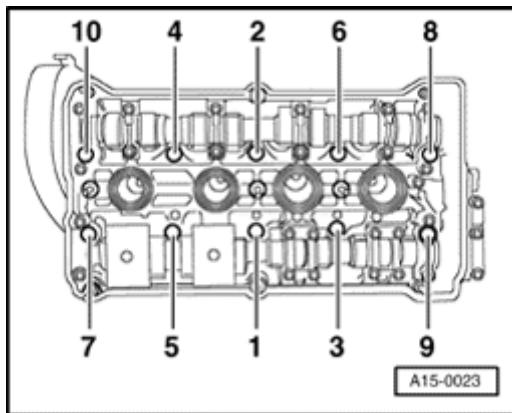
- ◆ *There must not be any oil or coolant in the cylinder head bolt pockets in the cylinder head.*
- ◆ *Only remove the new cylinder head gasket from its packing immediately before installing.*
- ◆ *Handle the new gasket with extreme care. Damage will lead to leaks.*
- Place a clean cloth in cylinders so that no dirt or emery cloth particles can get between cylinder wall and piston.

Note:

Ensure that dirt and emery cloth particles do not get into the coolant.

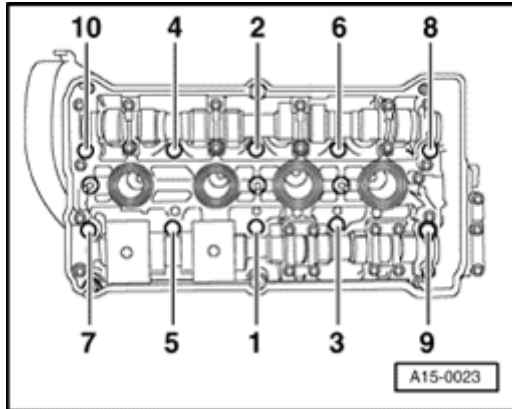


- Carefully clean cylinder head and cylinder block sealing surfaces to ensure that no scores or scratches are formed (when using abrasive paper the grade must not be less than 100).
- Carefully remove metal particles, emery remains and cloths.
- Set No. 1 cylinder piston to top dead center and then turn crankshaft back slightly.



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- To centralize, thread guide pins from 3070 into holes for cylinder head bolts 8 and 10.
- Install new cylinder head gasket. Lettering (Part No.) must be readable.
- Install cylinder head, thread in 8 remaining cylinder head bolts and tighten by hand.
- Remove guide pins with removal tool from 3070 by turning removal tool counter-clockwise until pins are free.
- Install remaining cylinder head bolts and tighten hand-tight.




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- Tighten cylinder head in following tightening sequence:
- Pretighten all bolts to 40 Nm.
- Then tighten all bolts to 60 Nm.
- Then tighten all bolts $\frac{1}{4}$ turn (90°) further using a rigid wrench.
- Then tighten all bolts again $\frac{1}{4}$ turn (90°) further.

Note:

- ◆ *The rest of the assembly is basically a reverse of the dismantling sequence.*
- ◆ *Installing toothed belt and adjusting timing \Rightarrow [Page 13-15](#)*
- ◆ *Filling with new coolant \Rightarrow [Page 19-18](#)*



<p>3122 B</p> 	<p>V.A.G 1331</p> 
<p>V.A.G 1763</p> 	
	<p>W15-0012</p>

Compression, checking

Special tools and equipment

- ◆ 3122 B Spark plug wrench
- ◆ VAG 1331 Torque wrench (5 to 50 Nm)
- ◆ VAG 1763 Compression tester



Conditions

- ◆ Engine oil temperature must be at least 30 °C.

Work sequence

- Disconnect ignition coil connector(s).
- Remove ignition coils.
- Remove spark plugs with spark plug 3122B.
- Have a second technician fully depress accelerator pedal.
- Check compression using compression tester VAG 1381/VAG 1763.

Note:

⇒ *compression tester operating instructions.*

- Operate starter until tester shows no further pressure increase.



Compression pressure

Engine code	new	Wear limit
AEB, ATW	10 to 13 bar	7.0 bar

Permissible difference between all cylinders: 3 bar

- Install ignition coils and tighten to 10 Nm.