

Servicing valve gear

Different valve gear designs

Since 09.94 the "light valve train" is installed instead of the "old valve train".

Important identification characteristics for the "light valve train":

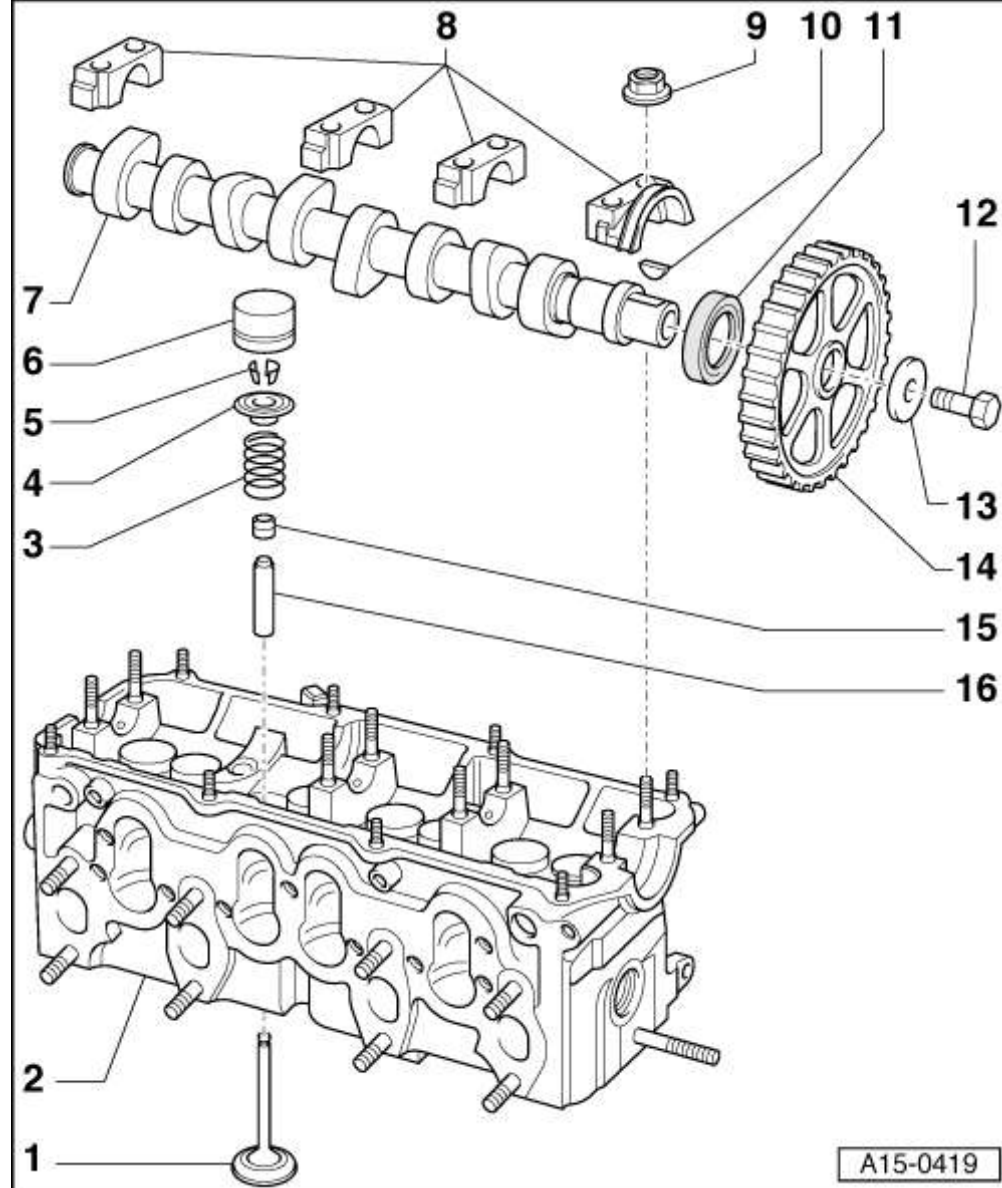
- ◆ One camshaft bearing has been discontinued
- ◆ Inner valve springs no longer used
- ◆ Lower valve plates no longer used
- ◆ The valve stem diameter was reduced
- ◆ Valve guide inside diameter reduced

Notes:

- ◆ Cylinder heads which have cracks between the valve seats or between valve seat inserts and the spark plug thread can be used further without reducing service life, provided the cracks do not exceed a maximum of 0.3 mm in width, or when no more than the first 4 turns of the spark plug threads are cracked.
- ◆ After installing the camshaft, wait for about 30 minutes before starting the engine. Hydraulic valve compensation elements have to settle (otherwise valves will strike pistons).
- ◆ After working on the valve gear, turn the engine carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated.
- ◆ Renew all gaskets and seals.
- ◆ The cylinder head with light valve train is shown in the following illustration.
- ◆ Old valve train identification marks=> Fig. [15-70](#).
- Valve
 - ◆ Do not rework only grinding in is permitted
 - ◆ Valve dimensions for old valve train=> Fig. [15-71](#)
 - ◆ Valve dimensions for light valve train=> Fig. [15-72](#)
- Cylinder head
 - ◆ See note=>Page [15-63](#)
 - ◆ Checking valve guides=>Page [15-95](#)
 - ◆ Rework valve seats=>Page [15-100](#)
- Valve springs
 - ◆ Only one valve spring per valve for

light valve gear

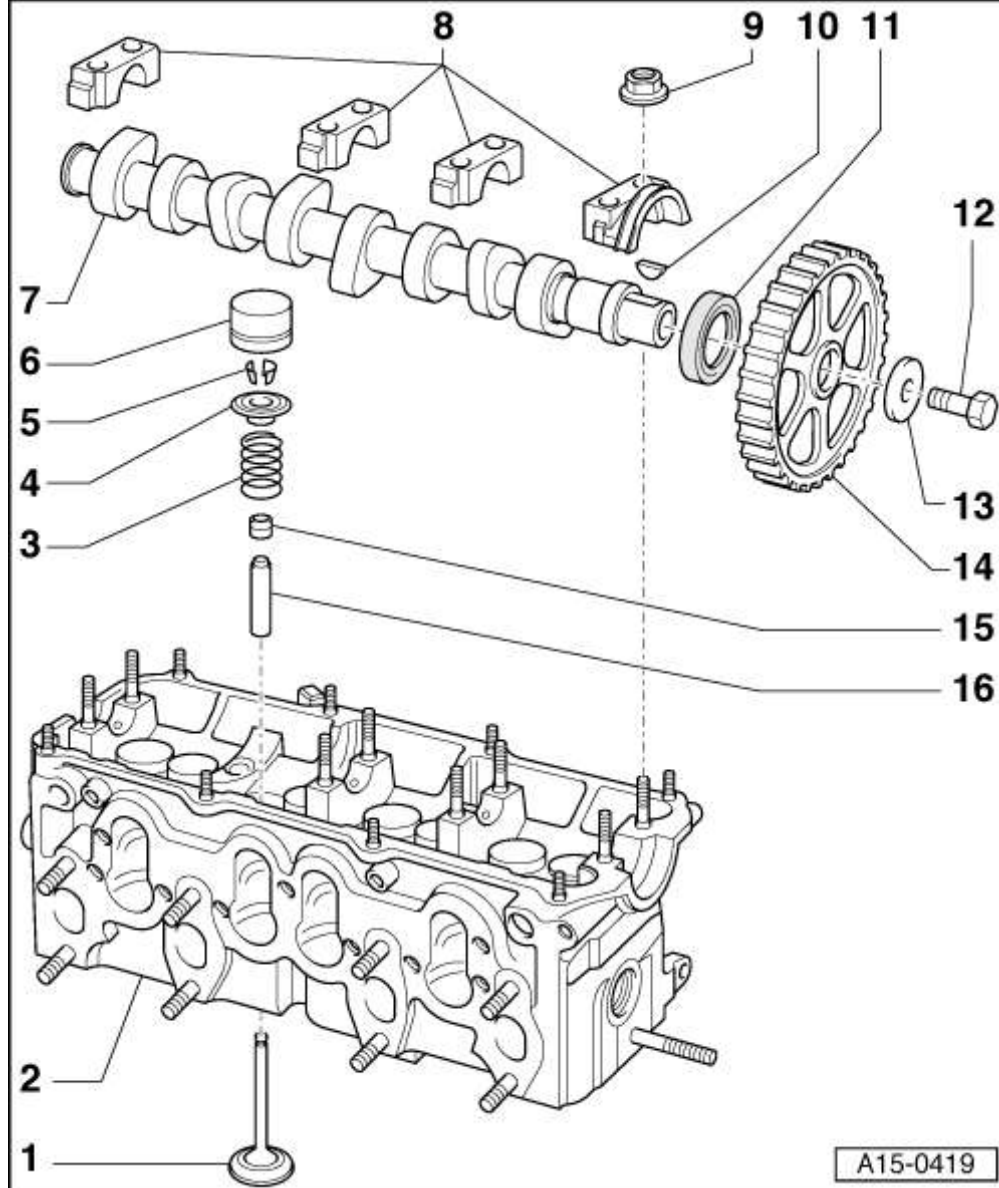
- ◆ Valve springs for old valve gear
=> Fig. [15-70](#)
- ◆ Removing and installing:
with cylinder head installed => Page [15-88](#)
with cylinder head removed with 2037



- Valve spring plate
- Valve cotters
- Hydraulic bucket tappet
 - ◆ Checking => Page [15-85](#)
 - ◆ Removing and installing
=>Page [15-88](#)
 - ◆ Do not interchange
 - ◆ Store with cam contact surface downwards
 - ◆ Before installing check camshaft axial play=> Fig. [15-70](#)
 - ◆ Oil contact surface
- Camshaft
 - ◆ Checking axial play=> Fig. [15-70](#)
 - ◆ Removing and installing

=>Page [15-79](#)

- ◆ Checking radial play with Plastigage
Wear limit: 0.1 mm
- ◆ Run-out:
no more than 0.01 mm



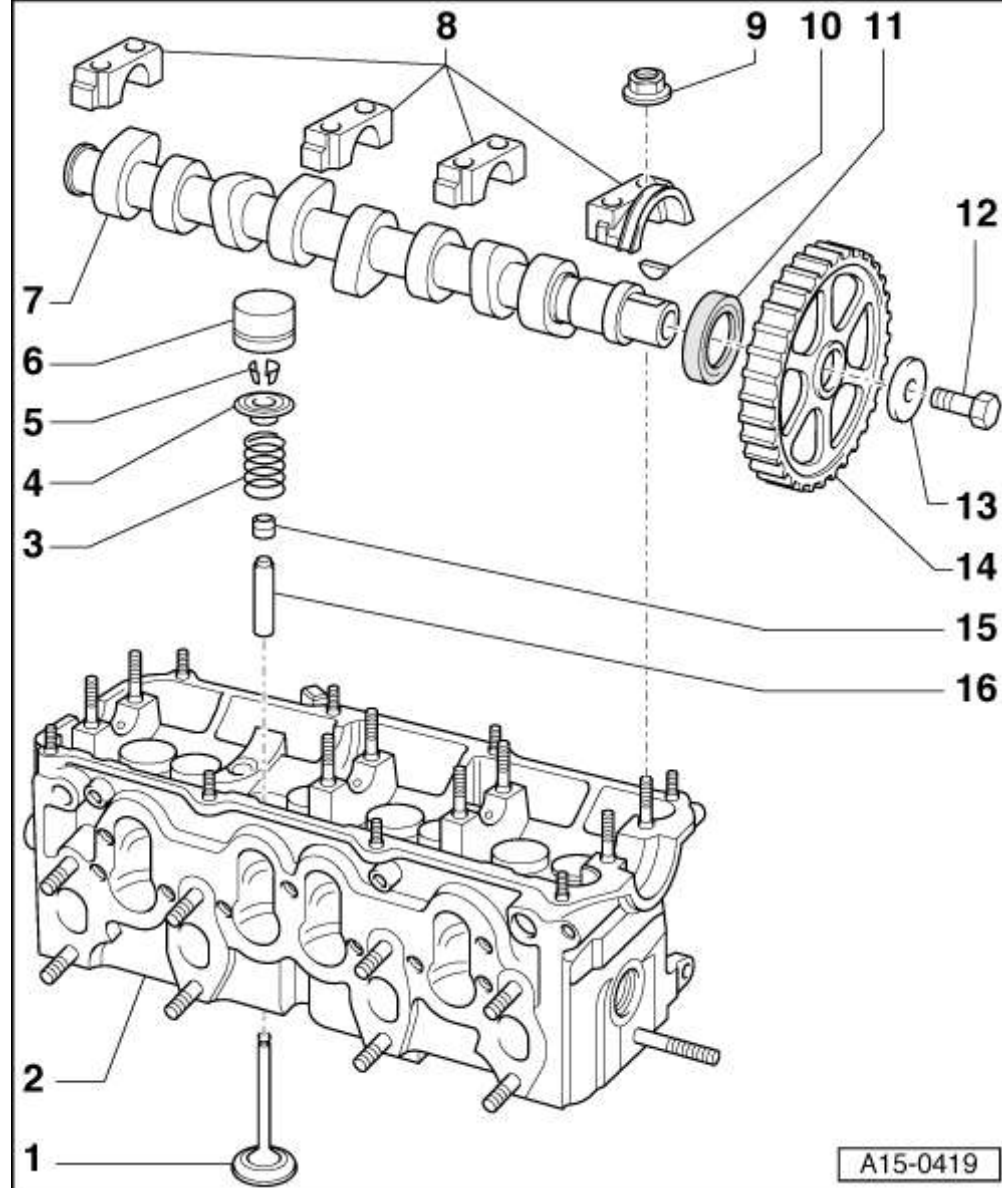
- Bearing cap

- ◆ Installation position => Fig. [15-72](#)
- ◆ Installation sequence=> Page [15-79](#), Removing and installing camshaft
- ◆ Before installation, apply thin coating of housing sealing compound to contact surfaces of bearing cap No. 1
- ◆ Housing sealing compound

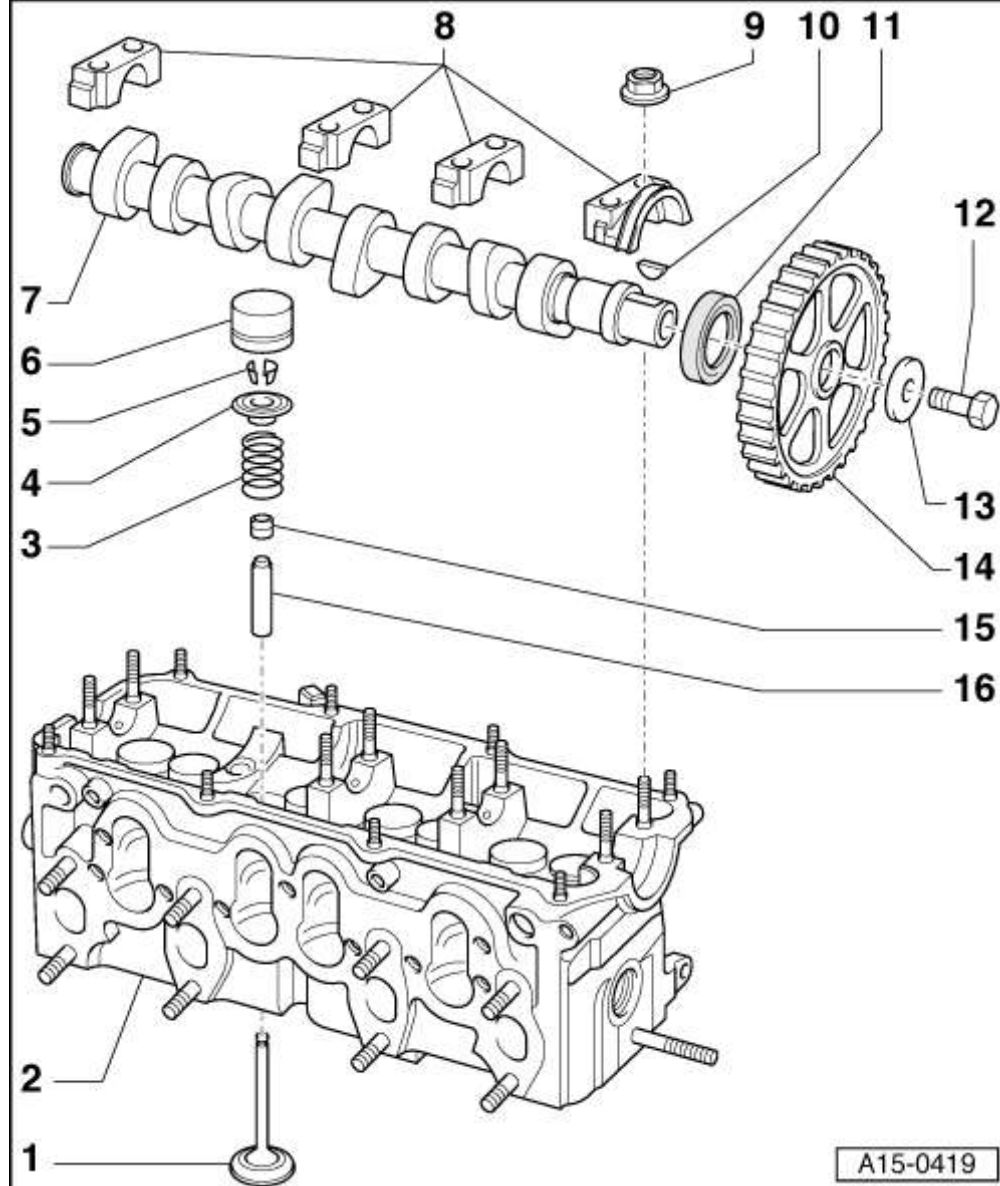
=> Parts List

- ◆ Applying sealant to sealing points
=> Fig. [15-7](#)

- 20 Nm
- Woodruff key
 - ♦ Ensure tight fit
- Sealing ring
 - ♦ Replacing => Page [15-73](#)



- 100 Nm
 - ♦ Counterhold with 3036 to loosen and tighten
- Washer
- Camshaft sprocket
 - ♦ For removal and installation remove toothed belt => Page [13-33](#)
 - ♦ Note correct installation position: The small web on the camshaft gear faces forward and the TDC mark on cylinder 1 is visible from the front =>Page [15-77](#)
 - ♦ Installation position is fixed by Woodruff key -Item



- Valve stem seal
 - ♦ Different valve stem seals for the old and light valve trains

=> Parts List

- ♦ Replacing => Page [15-88](#)

- Valve guide
 - ♦ Different valve guides for the old and light valve trains

=> Parts List

- ♦ Checking => Page [15-95](#)
- ♦ Replacing => Page [15-97](#)

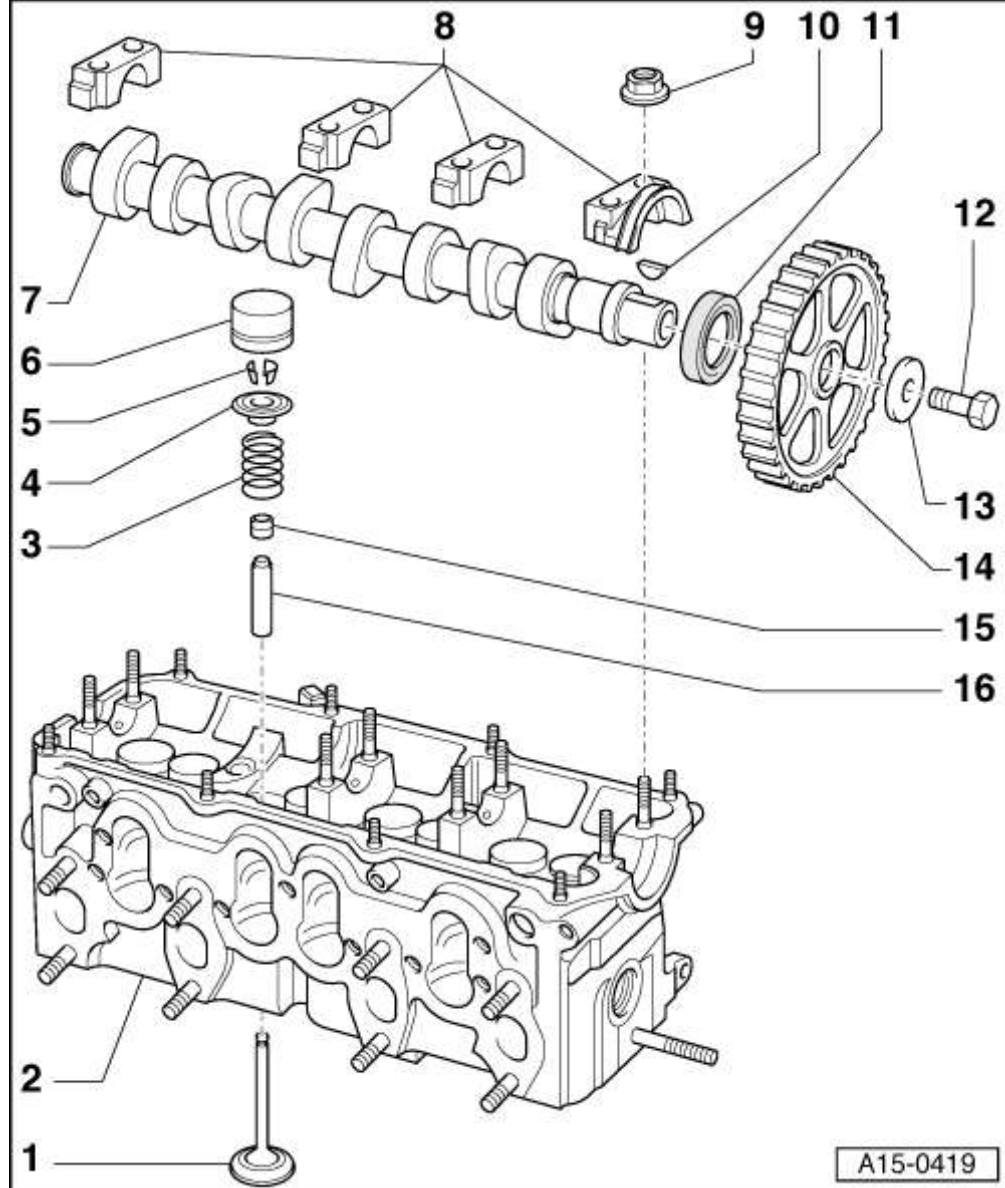


Fig. 1 Camshaft, checking axial play

Wear limit:
no more than 0.15 mm

Measure with tappets removed and with first
and last bearing caps fitted.

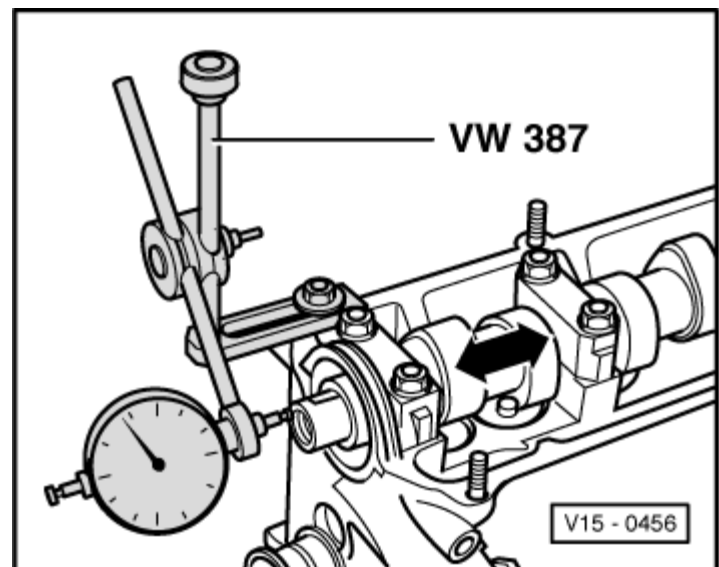


Fig.2 Old valve train

Engine codes AAD, ABB, ADA (all)

up to engine-No. AAE 032 209

up to engine-No. AB 243 926

up to engine-No. ADW 247 215

- 1 - Lower valve spring plate
- 2 - Valve stem seal
- 3 - Inner valve spring
- 4 - Outer valve spring
- 5 - Upper valve spring plate
- 6 - Valve cotters
- 7 - Hydraulic tappet

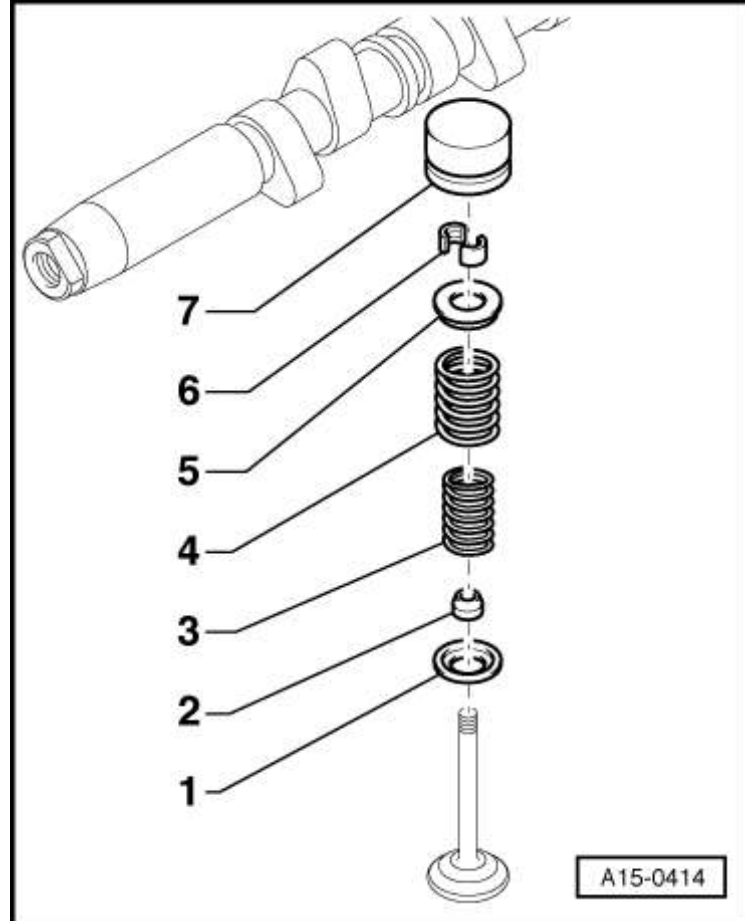


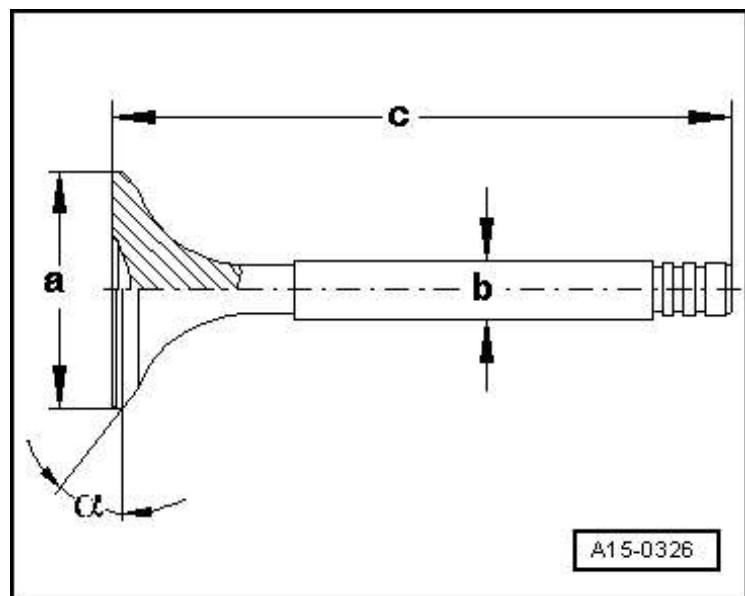
Fig. 3 Valve dimensions for old valve train

Engine codes AAD, ABB, ADA (all)

up to engine-No. AAE 032 209

up to engine-No. AB 243 926

up to engine-No. ADW 247 215



Dim.		Inlet valve	Exhaust valve
a	mm	40.0	33.0
b	mm	7.97	7.95
c	mm	91.9	91.2
		45	45

Note:

Valves must not be reworked. Only grinding in is permitted.

Fig. 4 Valve dimensions for light valve train

starting from engine-No. AAE 032 210

starting from engine-No. AB 243.927

starting from engine-No. ADW 247.216

Dim.		Inlet valve	Exhaust valve
a	mm	39.5 0.15	32.9 0.15
b	mm	6.92 0.02	6.92 0.02
c	mm	91.85	91.15
		45	45

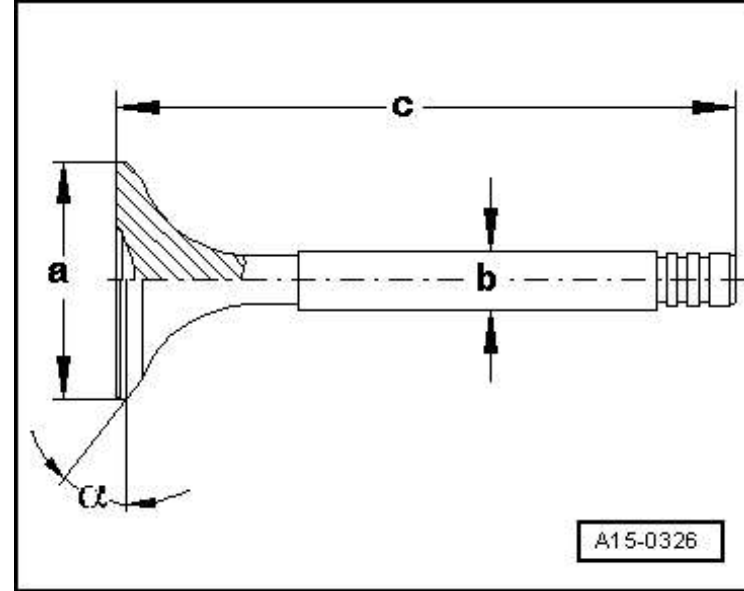


Fig. 5 Installation position of camshaft bearing caps

Note offset. Before installing camshaft fit bearing caps and determine installation position.

