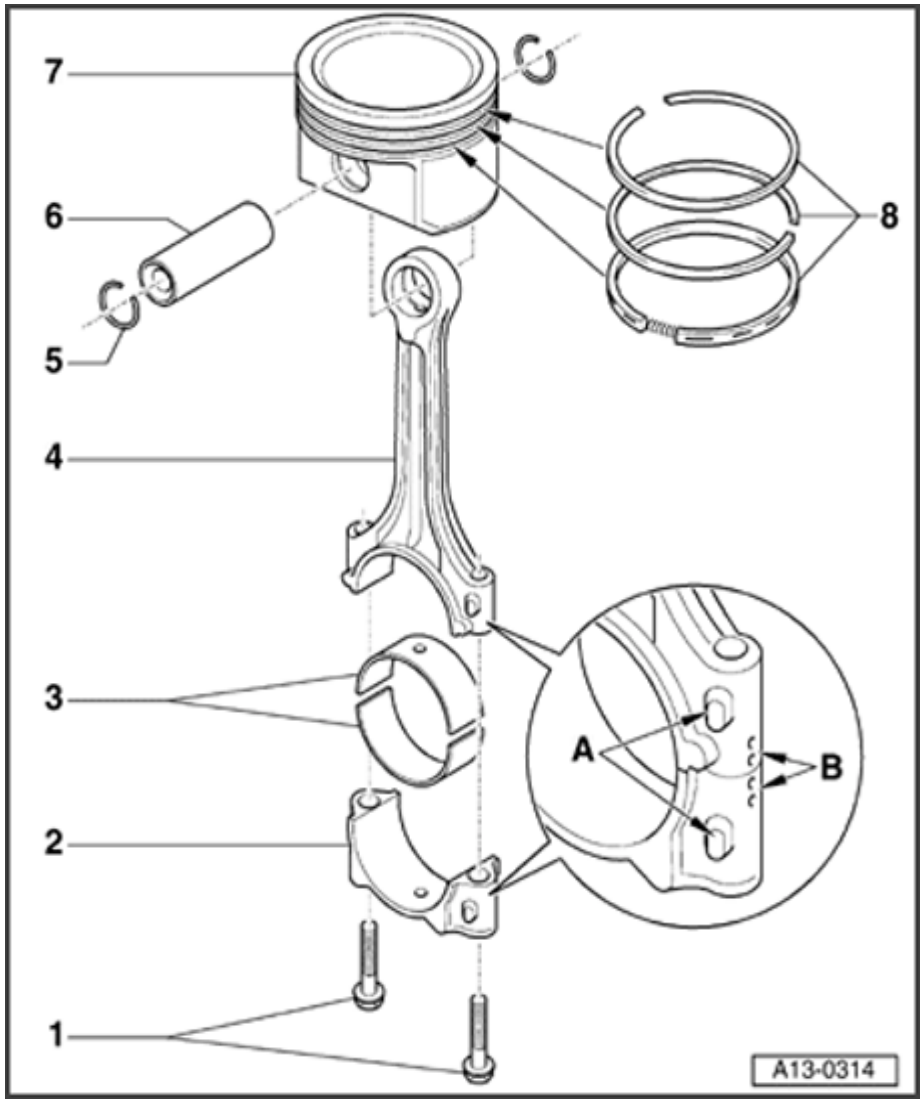
13-79



Pistons and connecting rods, disassembling and assembling

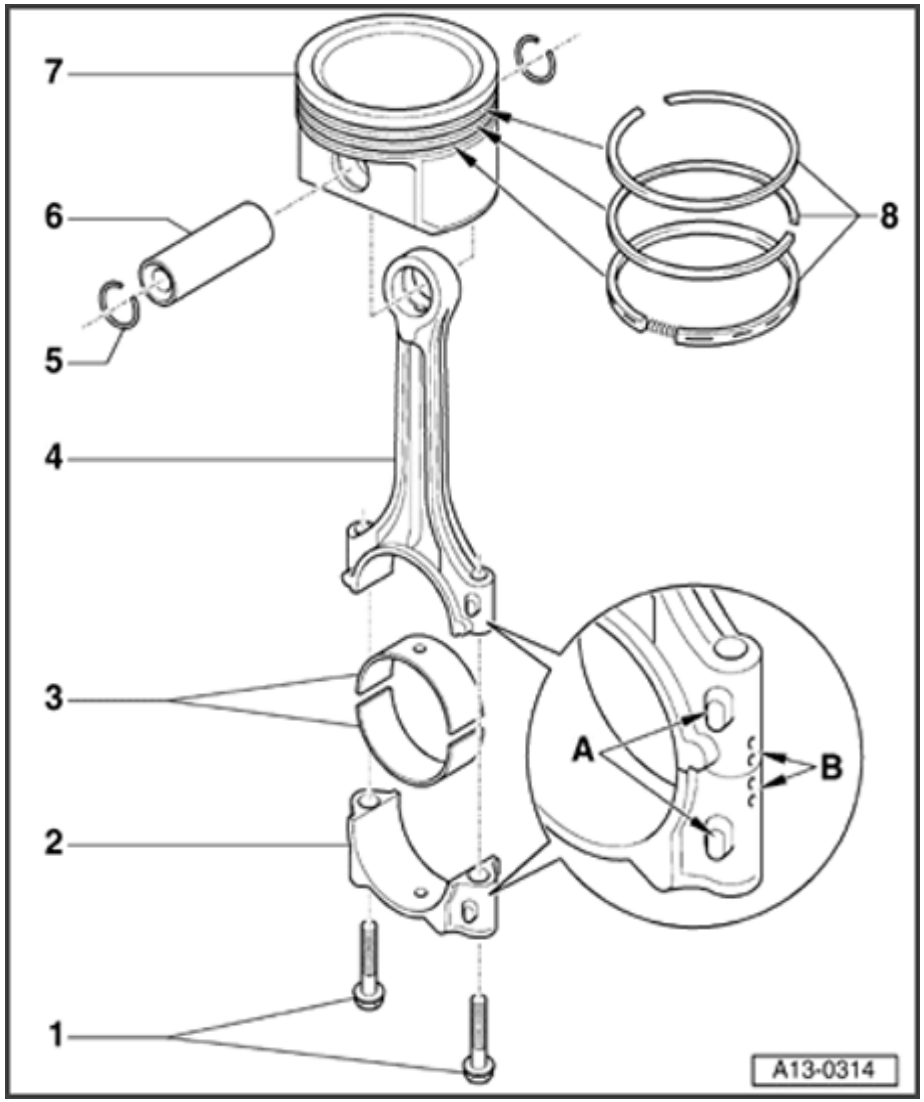
Note:

Oil spray jet and pressure relief valve⇒Fig. ⇒ 6 , ⇒ Page 13-85

1 - Conrod bolt - 30 Nm + $^{1}/_{4}$ turn (90 °) further

- Always replace
- Oil threads and contact surface
- To measure radial clearance use old bolt
- To measure radial clearance tighten to 30 Nm but not further

13-80



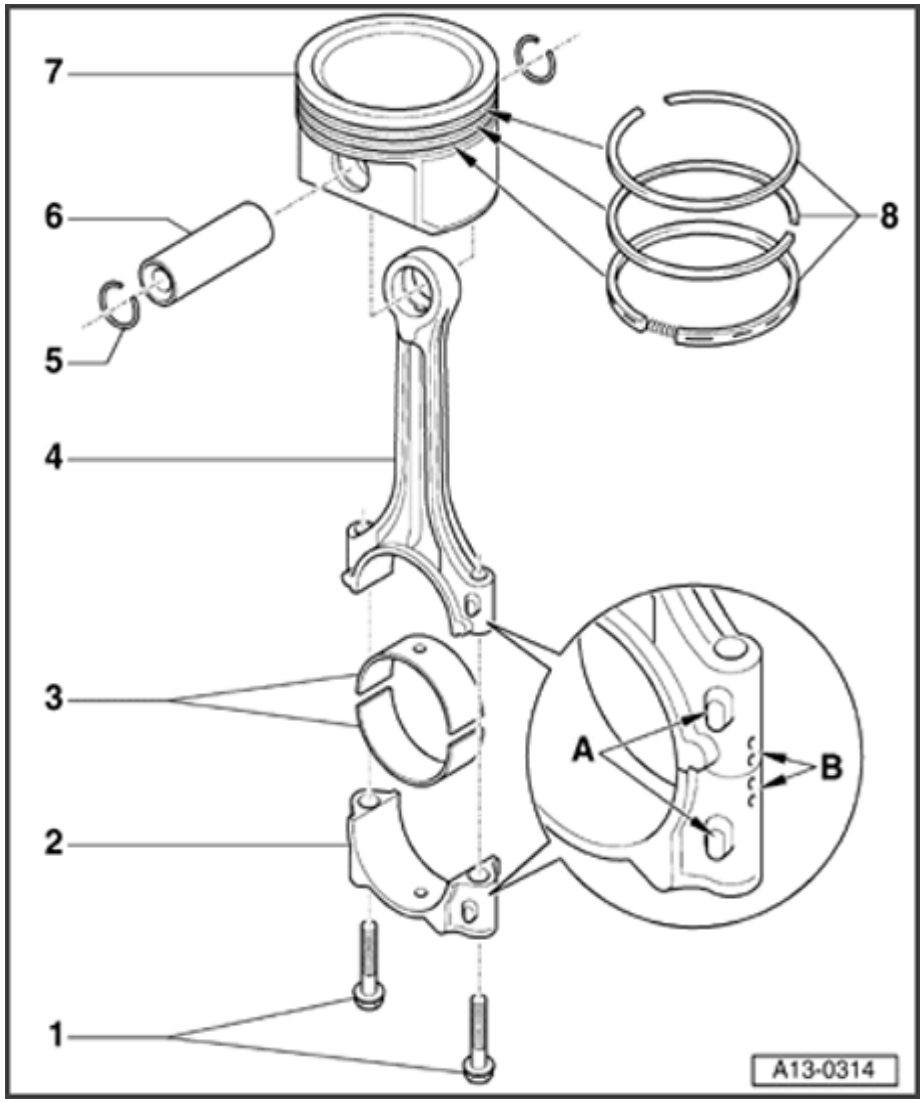
2 - Connecting rod bearing cap

- Mark cylinder number -B-
- Installation position: Markings -A- face towards pulley side

3 - Bearing shells

- Upper bearing shell with oil bore for piston bolt lubrication
- Installation position ⇒Fig. ⇒ 5 , ⇒ Page 13-85
- Do not interchange used bearing shells (mark).
- Axial clearance New: 0.10 to 0.35 mm, Wear limit: 0.40 mm
- Check radial clearance with Plastigage ™ : New: 0.01 to 0.05 mm, Wear limit: 0.12 mm. Do not rotate crankshaft when checking radial clearance

13-81



4 - Connecting rod

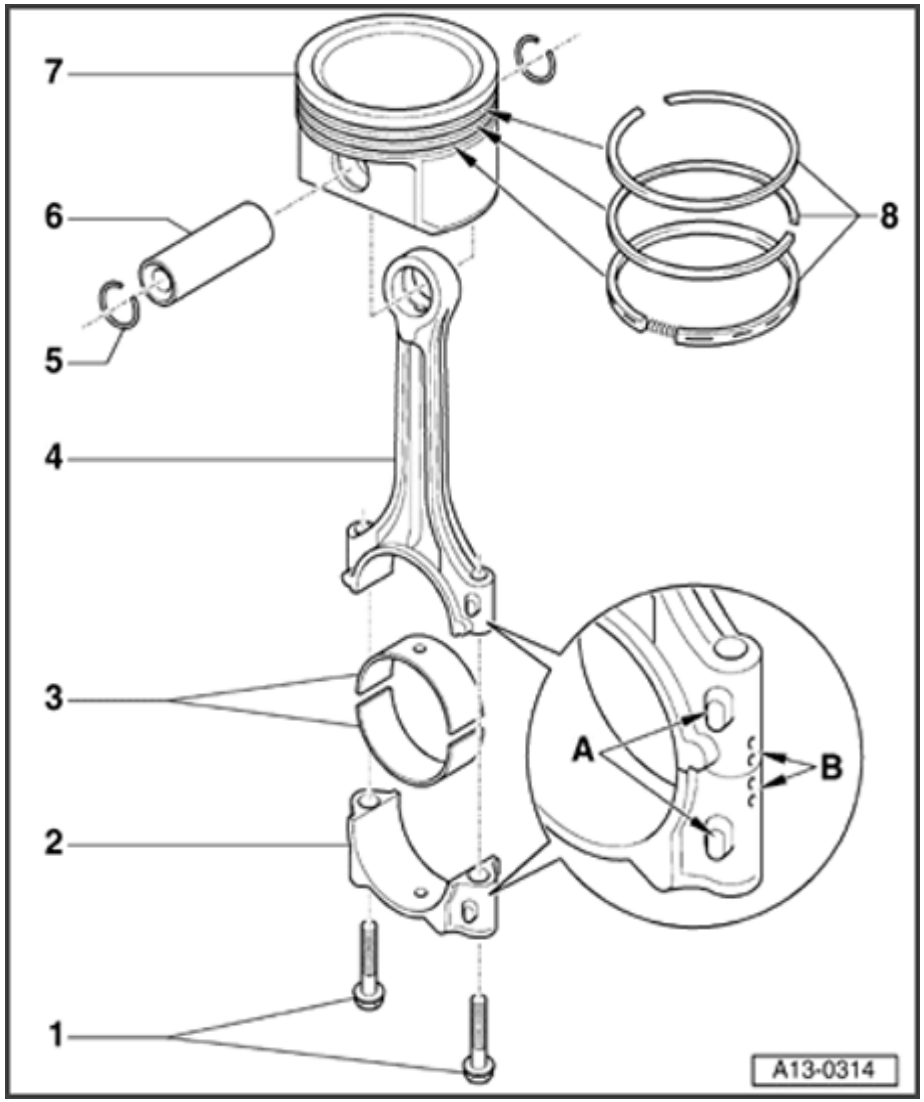
- Only replace as a set
- Mark cylinder number -B-
- Installation position: Markings -A- face toward pulley side
- With oil bore for piston pin lubrication

5 - Circlip

6 - Piston pin

- If difficult to remove, heat piston to approx. 60 ° C
- Remove and install with VW 222a

13-82



7 - Piston

- Checking ⇒ Fig. ⇒ 3 , ⇒ Page 13-84
- Mark installation position and cylinder number.
- Arrow on piston crown points to pulley end
- Install using piston ring clamp.
- Piston and cylinder dimensions ⇒ Page 13-86

8 - Piston rings

- Offset gaps by 120°
- Remove and install with piston ring pliers.
- "TOP" must face piston crown
- Check ring gap⇒Fig. ⇒ 1 , ⇒ Page 13-83
- Check ring to groove clearance⇒Fig. ⇒ 2 , ⇒ Page 13-83

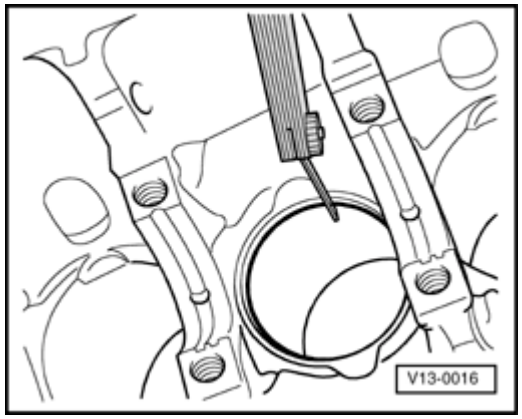


Fig. 1 Checking piston ring gap

- Push ring squarely from above down to approx. 15 mm from bottom end of cylinder. To do this, use a piston without rings.

Piston ring Dimensions in mm	New	Wear limit
1. compression ring	0.20 to 0.40	0.8
2. compression ring	0.20 to 0.40	0.8
Oil scraper ring	0.25 to 0.50	0.8

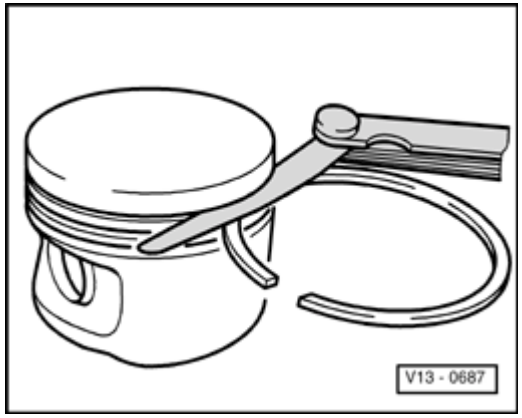


Fig. 2 Checking ring to groove clearance

- Clean groove before checking clearance.

Piston ring Dimensions in mm	New	Wear limit
1. compression ring	0.06 to 0.09	0.20
2. compression ring	0.05 to 0.08	0.20
Oil scraper ring	0.03 to 0.06	0.15

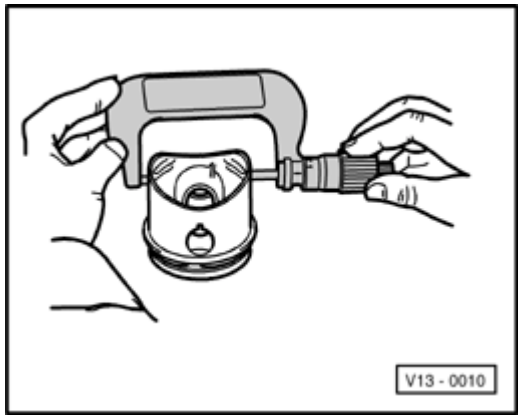


Fig. 3 Checking piston

- Measure pistons approx. 10 mm from lower edge of skirt, at 90° to piston pin axis.

• Permissible deviation from nominal dimension: no more than 0.04 mm

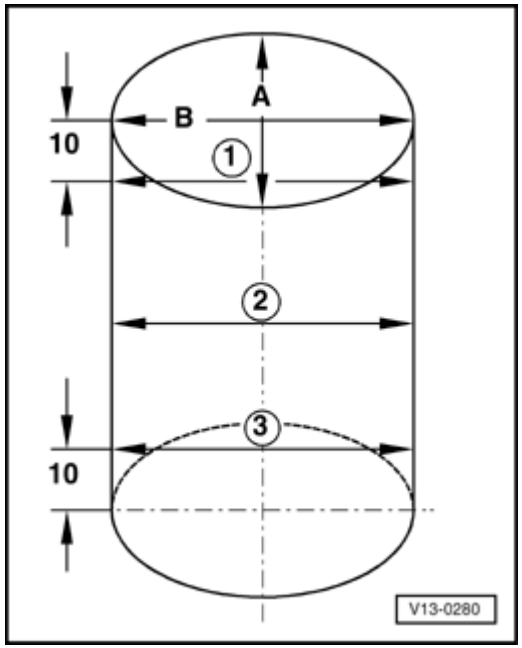


Fig. 4 Checking cylinder bores

Special tools and equipment

♦ Use internal dial gauge 50 to 100 mm

- Take measurements at 3 positions in both lateral direction -A- and longitudinal direction -B-.

• Permissible deviation from nominal dimension: no more than 0.08 mm

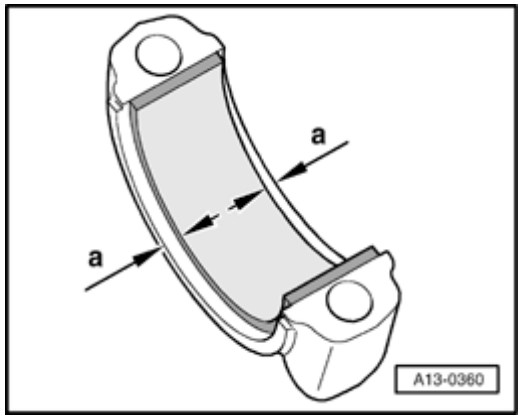


Fig. 5 Location of bearing shell

- Install bearing shells centrally into connecting rod or into connecting rod bearing cap.
  - ♦ Distance a = 3.0 mm

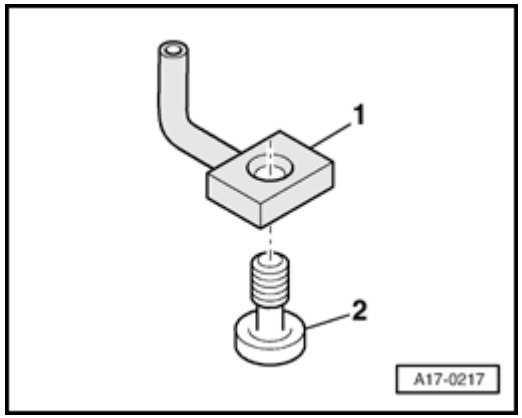


Fig. 6 Oil spray jet and pressure relief valve

1 - Oil spray jet (for piston cooling)

2 - Bolt with pressure relief valve - 27 Nm
  - ♦ Opening pressure 1.3 to 1.6 bar

Piston and cylinder dimensions

Honing dimension		Piston diameter	Bore diameter
Basic dimension	mm	80.950 1)	81.01
Oversize	mm	81.450 1)	81.51

1) Dimension without graphite coating (thickness 0.02 mm). The graphite coating on the piston skirts wears away.