

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### 13 Engine-Crankshaft, Cylinder block (Page GR-13)

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- **Engine, disassembly and assembly**
- 10-222 A/21 guide from 10-222 A support tool, modifying
- Ribbed belt, removing and installing
- Semi-automatic toothed belt tensioning roller, checking
- Toothed belt, removing, installing and tensioning
- **Sealing flange and flywheel/drive plate, removing and installing**
- Crankshaft oil seal (pulley end), replacing
- Drive plate, removing and installing
- Sealing flange (front), removing and installing
- **Crankshaft, removing and installing**
- Crankshaft dimensions
- **Pistons and connecting rods, disassembling and assembling**
- Piston and cylinder dimensions

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-1)**

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**Notes:**

*If during engine repairs, metal shavings or large quantities of small metal particles - caused, for example, by partial seizure of crankshaft and conrod bearings - are found in the engine oil: To prevent consequential damage, besides thoroughly cleaning out the oil passages, you must also replace the oil cooler.*

I ⇒ [Page 13-2](#)

II ⇒ [Page 13-5](#)

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-2)**

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**Part I**

**1 - 45 Nm (33 ft lb)**

**2 - Engine support**

**3 - 25 Nm (18 ft lb)**

**4 - Bracket**

**5 - Toothed belt guard, upper section**

**6 - Toothed belt guard, center section**

**7 - 20 Nm (15 ft lb)**

**8 - Washer**

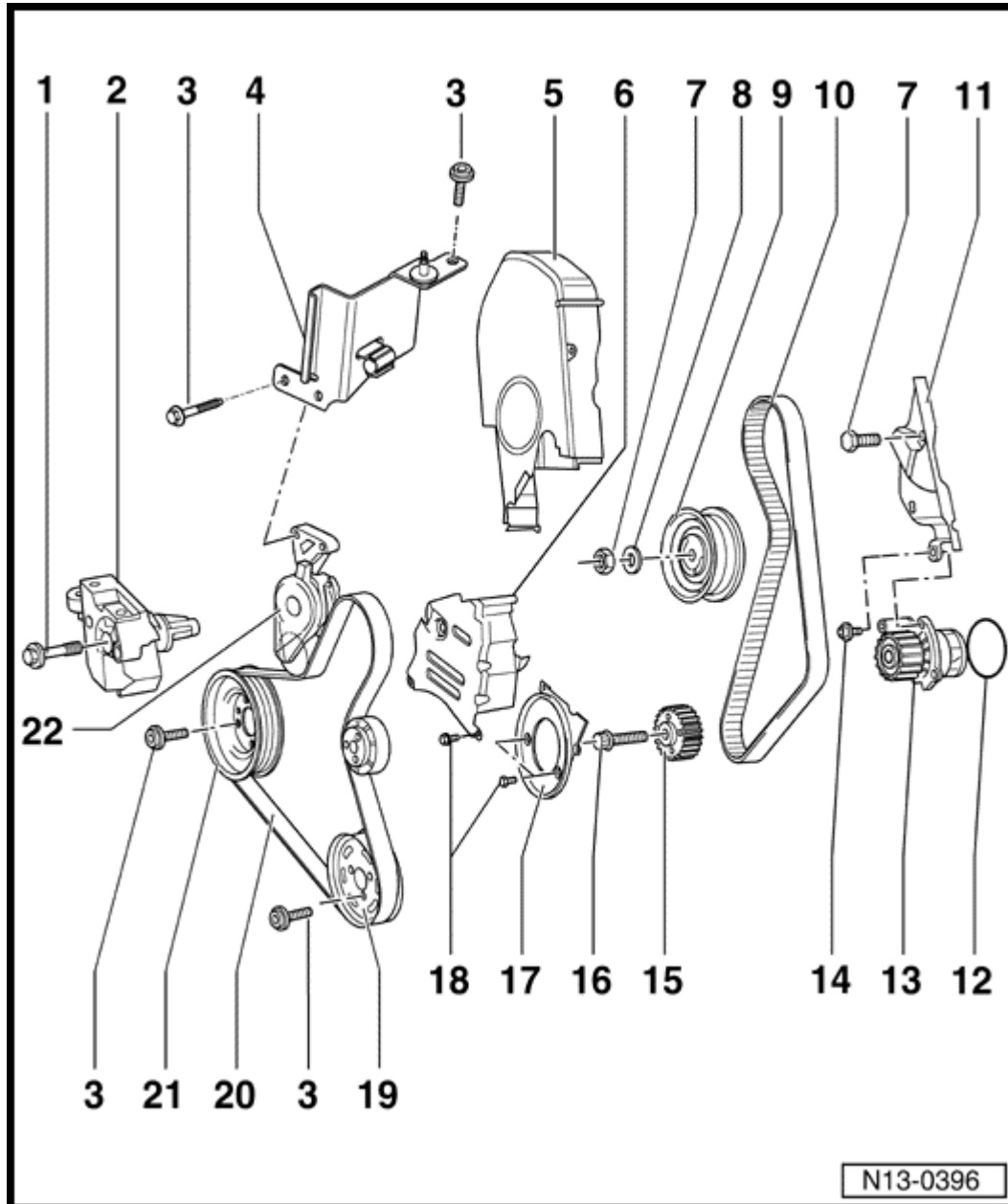
**9 - Tensioner**

- ♦ Semi - automatic toothed belt tensioning roller, checking: ⇒ [Page 13-18](#)

**10 - Toothed belt**

- Mark engine direction of rotation before removing
- Check for wear
- Do not kink
- ♦ Removing, installing and tensioning ⇒ [Page 13-11](#)

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-3)**



- 11 - Toothed belt guard, rear**
- 12 - O - ring**
  - Replace
- 13 - Coolant pump**
- 14 - 15 Nm (11 ft lb)**
- 15 - Toothed belt sprocket (crankshaft)**
- 16 - 90 Nm (66 ft lb) + 1 /4 turn (90 ° ) further**
  - Replace
  - ♦ Threads and shoulder must be free of oil and grease
  - Counter - hold with 3099 to loosen and tighten

**17 - Toothed belt guard - lower part**

**18 - 10 Nm (7 ft lb)**

**19 - Pulley**

- ◆ for power steering pump

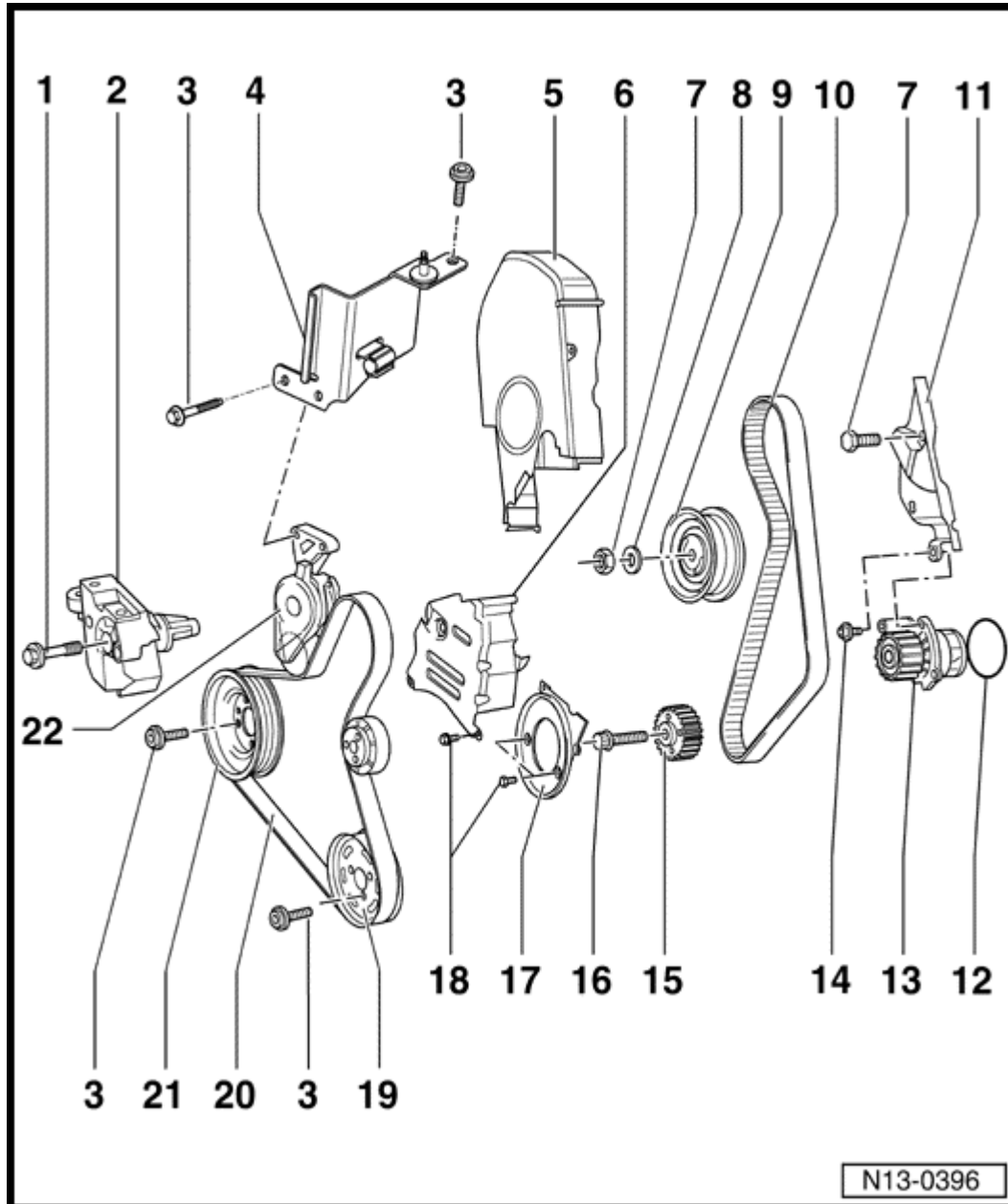
**20 - Ribbed belt**

- Mark direction of rotation before removing

- ◆ Removing and installing ⇒ [Page 13-8](#)

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-4)**

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**21 - Belt pulley/vibration damper**

- ♦ Can only be installed in one position, holes are off - set
- ♦ Note position when installing toothed belt ⇒ [Page 13-11](#)

**22 - Ribbed belt, tensioning device**

- Slacken ribbed belt by turning with open - end wrench ⇒ [Page 13-8](#)

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-5)**

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**Part II**

**1 - Knock sensor 1 G61**

- ◆ Checking:

⇒ Repair Group 01

**2 - 2 - pin harness connector**

- ◆ Black

**3 - 20 Nm (15 ft lb)**

- ◆ Tightening torque influences knock sensor function

**4 - 2 - pin harness connector**

- ◆ Black

**5 - Knock sensor 2 G66**

- ◆ Checking:

⇒ Repair Group 01

**6 - Dipstick**

- ◆ Oil level must not be above MAX. mark!

**7 - Coolant pipe**

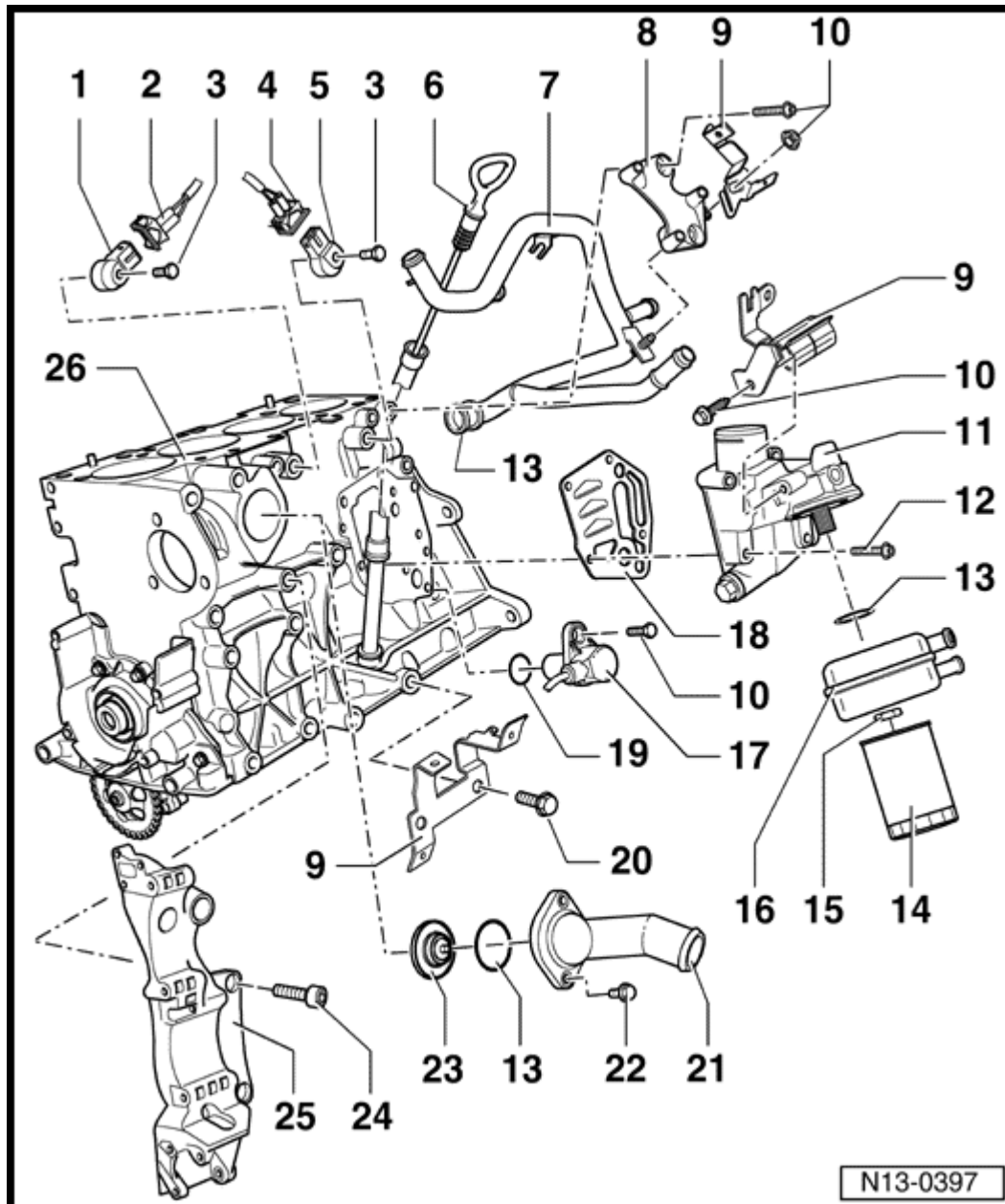
**8 - Bracket**

- ◆ for ignition coils

**9 - Bracket**

**10 - 10 Nm (7 ft lb)**

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-6)**



**11 - Oil filter bracket**

♦ Disassembly and assembly ⇒ [Page 17-4](#)

**12 - 15 Nm (11 ft lb) + 1 / 4 turn (90 ° ) further**

**13 - Sealing ring**

- Replace

**14 - Oil filter**

- Loosen with strap wrench

- Tighten by hand

- Note instructions on filter when installing

**15 - 25 Nm (18 ft lb)**

## **16 - Oil cooler**

- Coat contact area to flange, outside the seal, with: AMV 188 100 02
- Ensure clearance between adjacent components
- See note ⇒ [Page 13-1](#)

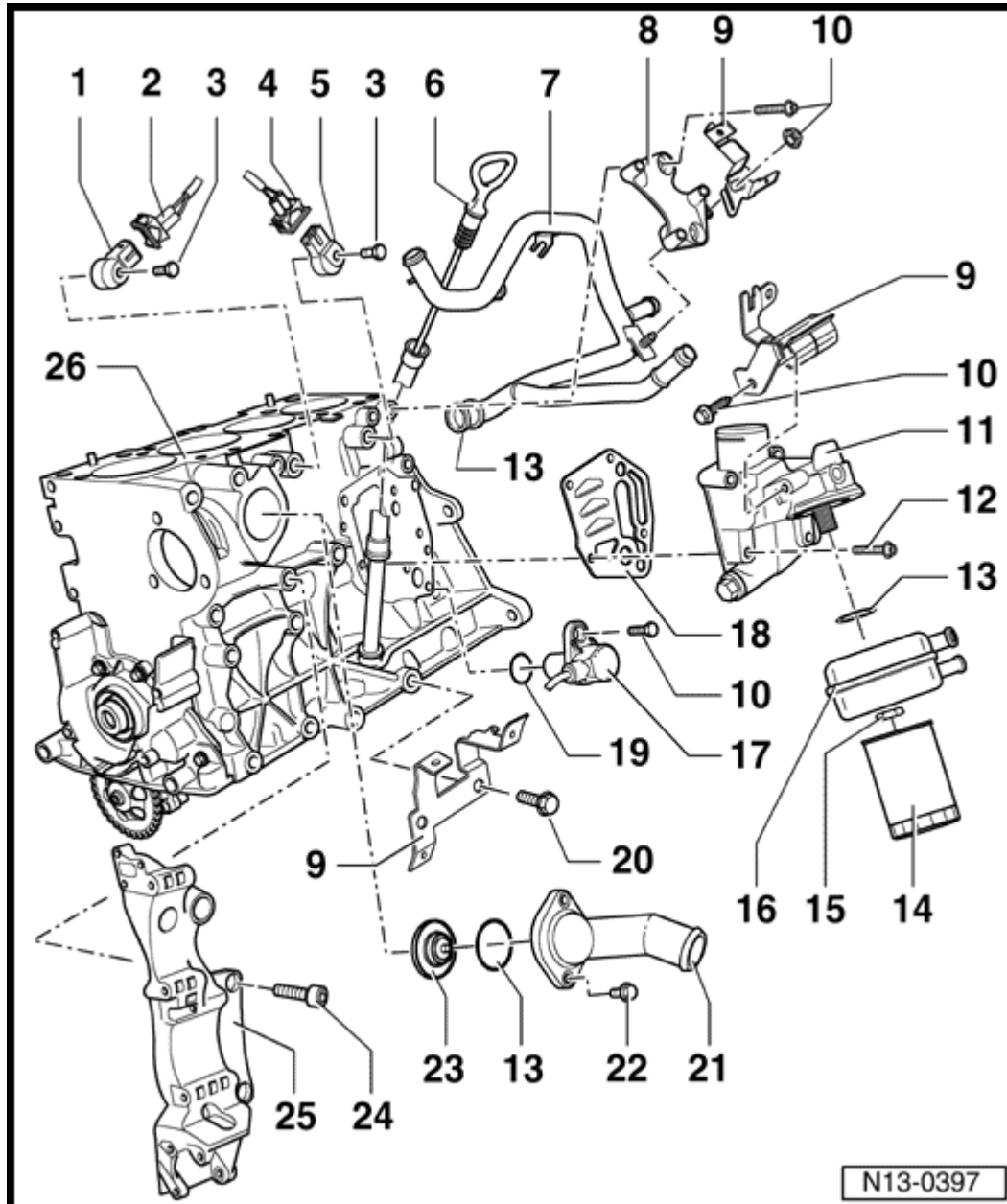
## **17 - Engine speed sensor**

- ◆ Checking:
- ⇒ Repair Group 01

## **18 - Gasket**

- Replace

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-7)**



**19 - Sealing ring**

- Replace if damaged

**20 - 40 Nm (30 ft lb)**

**21 - Connection**

**22 - 15 Nm (11 ft lb)**

**23 - Coolant thermostat**

- ◆ Checking: heat - up thermostat in water
- ◆ Opening starts approx. 86° C
- ◆ Opening lift: 7 mm minimum
- ◆ Removing and installing ⇒ [Page 13-8](#)

**24 - 45 Nm (33 ft lb)**

**25 - Assembly bracket**

- ◆ for coolant pump, coolant thermostat, ribbed belt tensioning roller, Generator and power steering pump

**26 - Engine block**

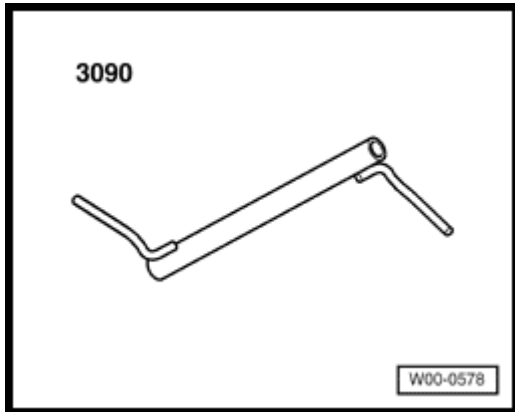
- ◆ Sealing flange and flywheel/drive plate, removing and installing ⇒ [Page 13-19](#)
- ◆ Crankshaft, removing and installing ⇒ [Page 13-32](#)
- ◆ Pistons and conrods: disassembly and assembly ⇒ [Page 13-36](#)

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-8)**

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**Ribbed belt, removing and installing**

Special tools, workshop equipment, testers, measuring instruments and auxiliary items required



**A**

- ◆ 3090 Connecting rod support

## Volkswagen New Beetle

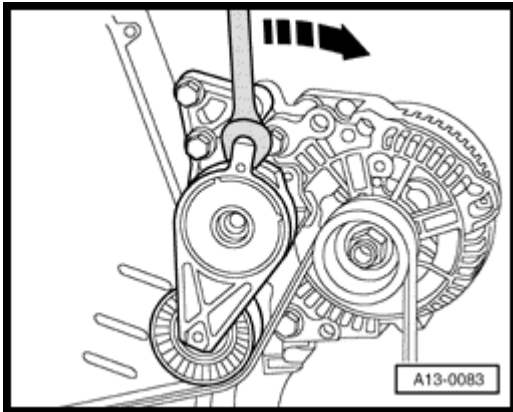
### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Engine, disassembly and assembly (Page 13-9)

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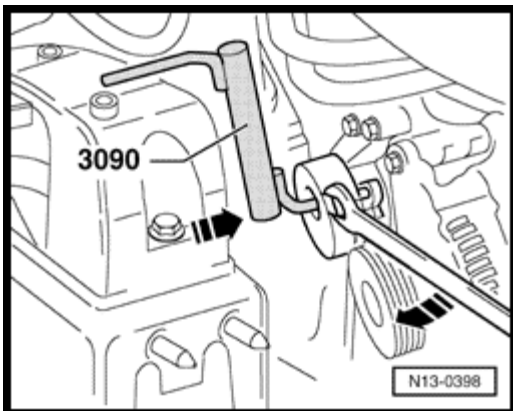
#### Work sequence

- Remove right - hand insulation tray
- ⇒ General body repairs; Repair group 50
- Mark direction of rotation on ribbed belt.



▲

- Turn tensioning device in direction of arrow to relieve ribbed belt tension.



▲

- Lock tensioning device with 3090
- Remove or install ribbed belt.

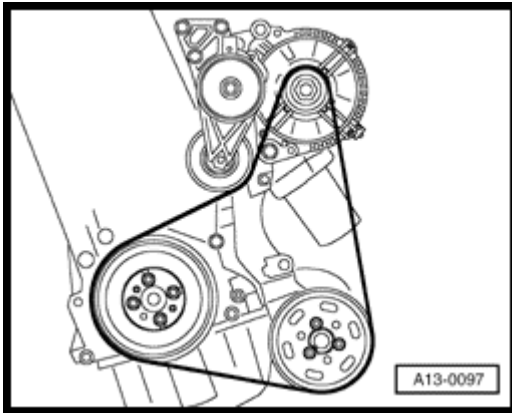
#### Notes:

*When installing the ribbed belt, ensure that it fits correctly in the pulley grooves.*

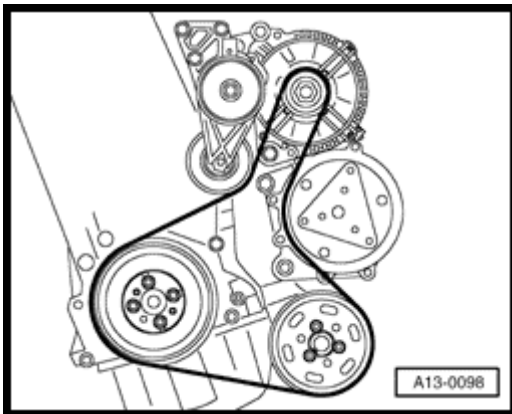
- Start engine and check belt running.

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-10)**

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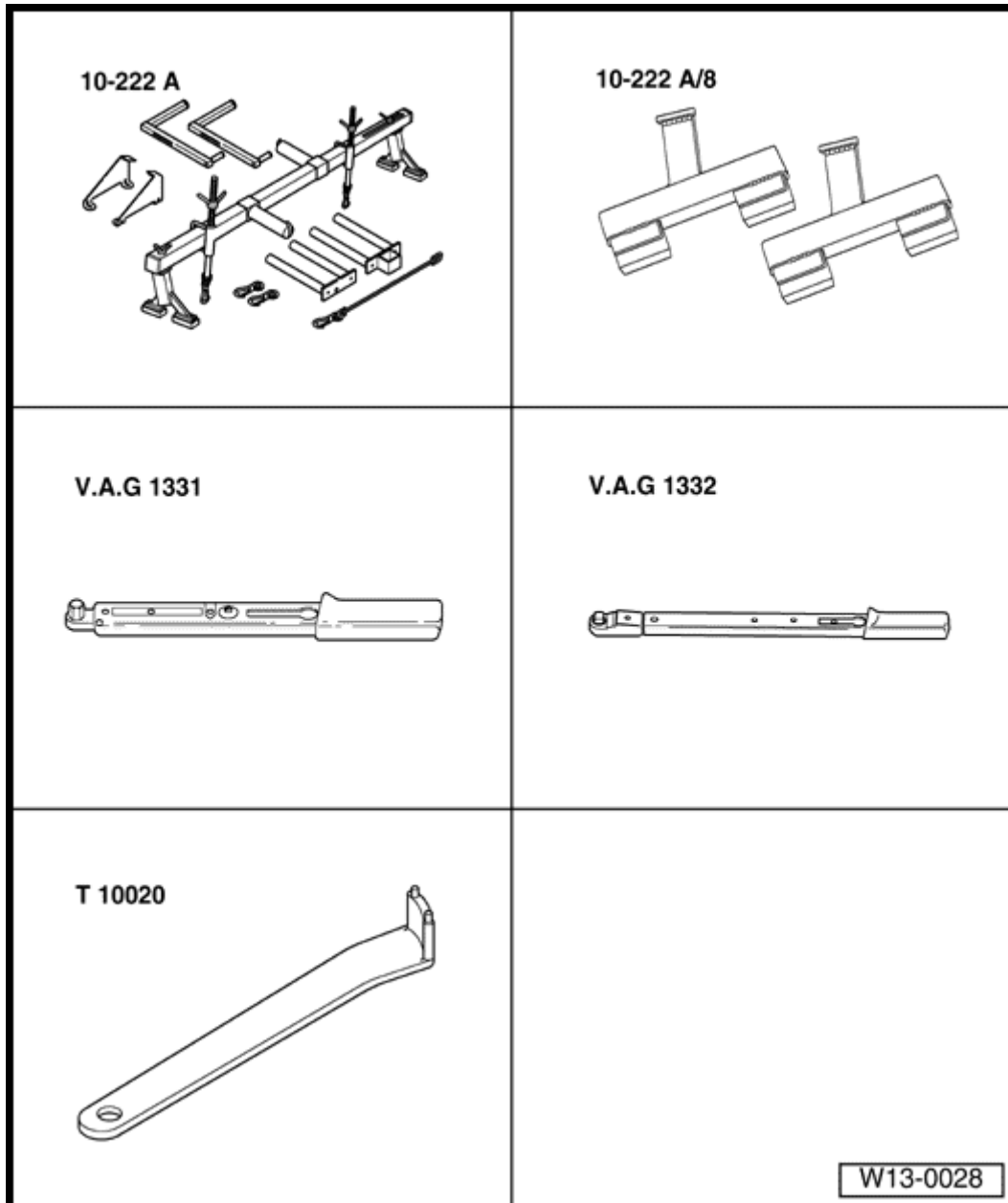
**A**  
Belt drive without A/C compressor



**A**  
Belt drive with A/C compressor

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-11)**

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**Toothed belt, removing, installing and tensioning**

(Adjusting control times)

**Special tools, workshop equipment, test and measuring appliances and auxiliary items required**

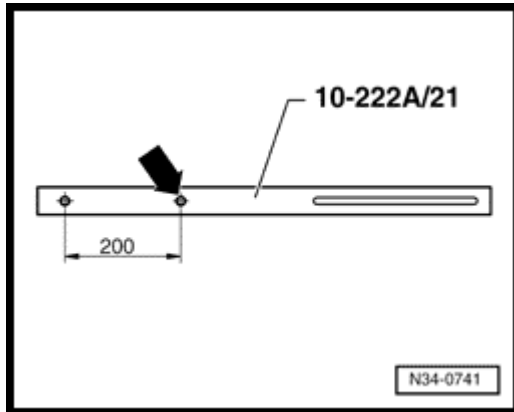
- ◆ 10 - 222 A Support
- ◆ 10 - 222 A/8 Adapter
- ◆ VAG 1331 Torque wrench 5 to 50 Nm (3.7 to 37 ft lb)
- ◆ VAG 1332 Torque wrench 40 to 200 Nm (30 to 148 ft lb)
- ◆ T 10020 Two hole nut wrench

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-12)**

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**10 - 222 A/21 guide from 10 - 222 A support tool, modifying**

- Use 0 - 222A support tool to support engine/transmission.



**A**

- To fasten 10 - 222 A/8 adapter to 10 - 222 A/21 guide; drill a new hole. Dimensions are in mm.
- One hole 12.5 mm  $\varnothing$  (arrow) drilled in 10 - 222 A/21 guide

## Volkswagen New Beetle

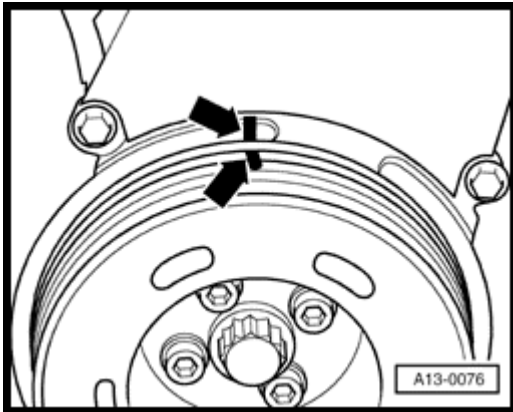
### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Engine, disassembly and assembly (Page 13-13)

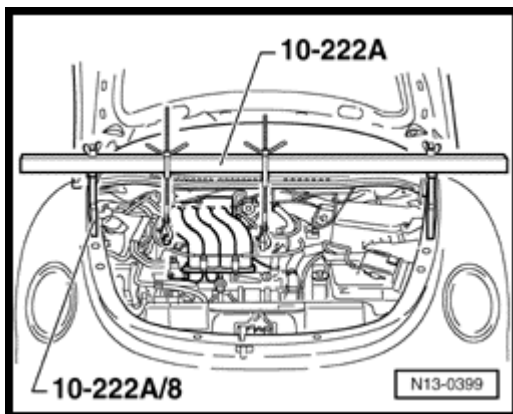
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#### Removing

- Remove right - hand insulation tray  
⇒ General body repairs; Repair group 50
- Remove engine cover.
- Remove ribbed belt ⇒ [Page 13-8](#) .
- Remove ribbed belt tensioning element.



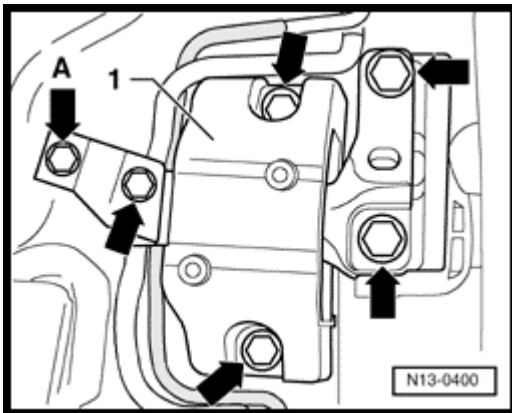
- Turn crankshaft to cyl. 1 TDC.
- Remove toothed belt guard - upper section



- Install 10 - 222A support with legs 10 - 222A/8 as shown.

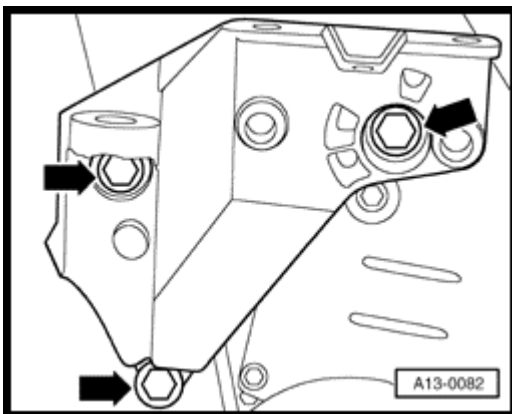
**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-14)**

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**A**

- Remove engine mount - 1 - as follows:
- Unscrew bolts - arrows -
- Loosen bolt - arrow A -
- Remove vibration damper/belt pulley.
- Install toothed belt guard center and lower sections.



**A**

- Unscrew engine bracket from engine block

**Note:**

*To loosen front screw of bracket; raise engine slightly using the support.*

- Mark engine direction of rotation on toothed belt.
- Release tensioner and take off toothed belt.
- Turn crankshaft back slightly.

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Engine, disassembly and assembly (Page 13-15)

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### Installing

#### Notes:

*If piston is at TDC; the valves could strike the piston when turning the camshaft.*

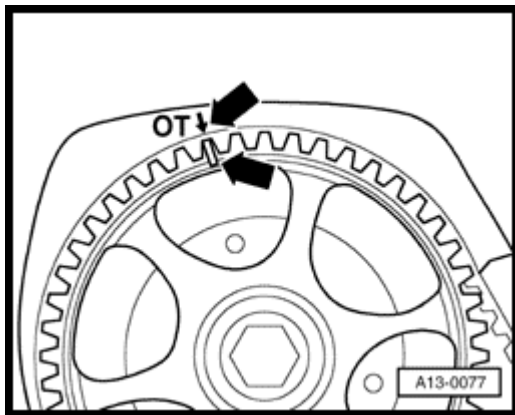
#### A - Toothed belt completely removed

If toothed belt has only been removed from camshaft ⇒ [Page 13-16](#)

#### Conditions

- Pistons must NOT be positioned at TDC.

#### Work sequence



#### A

- Bring mark on camshaft into line with the mark on toothed belt guard.
- Place toothed belt on crankshaft pulley and coolant pump (observe engine direction of rotation).
- Install bracket to engine block.
  - 45 Nm (33 ft lb)

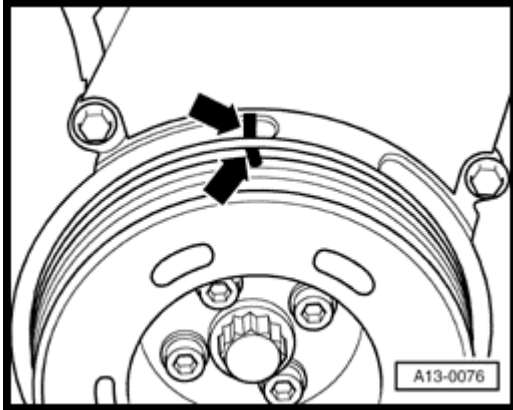
#### Note:

*Insert screws before installing engine support.*

## Volkswagen New Beetle 2.0 Liter 4-cyl General, Engine (Engine Code AEG) Engine, disassembly and assembly (Page 13-16)

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- Install toothed belt guard center and lower sections.
- Install vibration damper/belt pulley
  - Tightening torque: 25 Nm (18 ft lb)



**A**

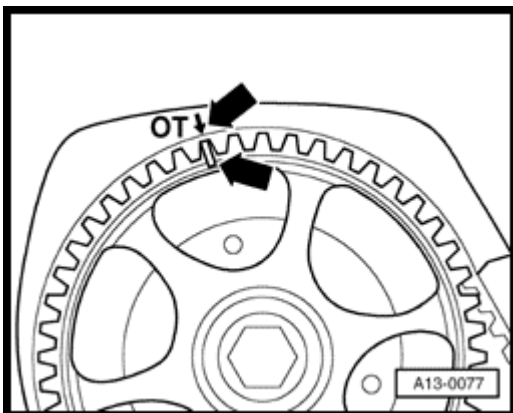
- Turn crankshaft to cyl. 1 TDC
- Install engine mount (replace bolts).
  - Tightening torque: ⇒ [Page 10-14](#)
- Remove 10 - 222 A support.
- Place toothed belt on tensioning roller and camshaft sprocket and tension ⇒ [Page 13-17](#).

### **B - Toothed belt, removed from camshaft sprocket only**

#### **Conditions**

- Pistons must NOT be positioned at TDC.

#### **Work sequence**



**A**

- Align mark on camshaft with line on toothed belt guard.
- Turn crankshaft to TDC cyl. 1.
- Place toothed belt on camshaft sprocket and tension ⇒ [Page 13-17](#).

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

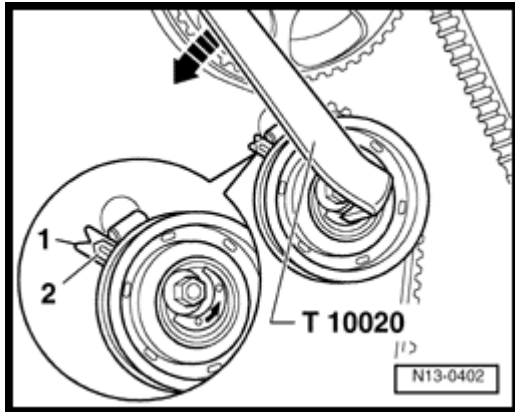
#### Engine, disassembly and assembly (Page 13-17)

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### Toothed belt, tensioning

#### Requirements

- Engine must be warm to the touch
- Camshaft sprocket at cyl. 1 TDC.



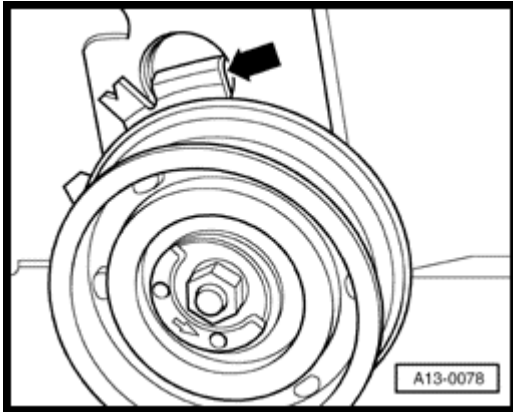
#### A

- Tension toothed belt by turning eccentric to left with T 10020 2 hole wrench until notch - 1 - and indicator - 2 - align.
- Tighten securing nut
  - 20 Nm (15 ft lb)
- Turn crankshaft two rotations in engine engine direction of rotation and check toothed belt tension again.
- Install toothed belt guard, upper section.
- Install ribbed belt tensioner.
  - Tightening torque: 25 Nm (18 ft lb)
- Install ribbed belt ⇒ [Page 13-8](#) .
- Install sound dampening pan and engine cover.

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Engine, disassembly and assembly (Page 13-18)**

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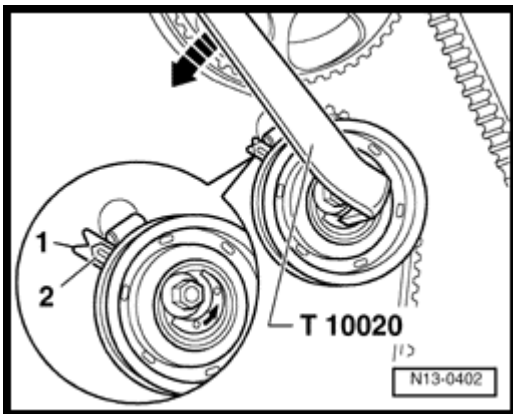
**Semi - automatic toothed belt tensioning roller, checking  
Installation position**



- Angled retainer - arrow - must be located in cut - out on cylinder head.

**Test sequence**

- Place camshaft sprocket on cyl. 1 TDC

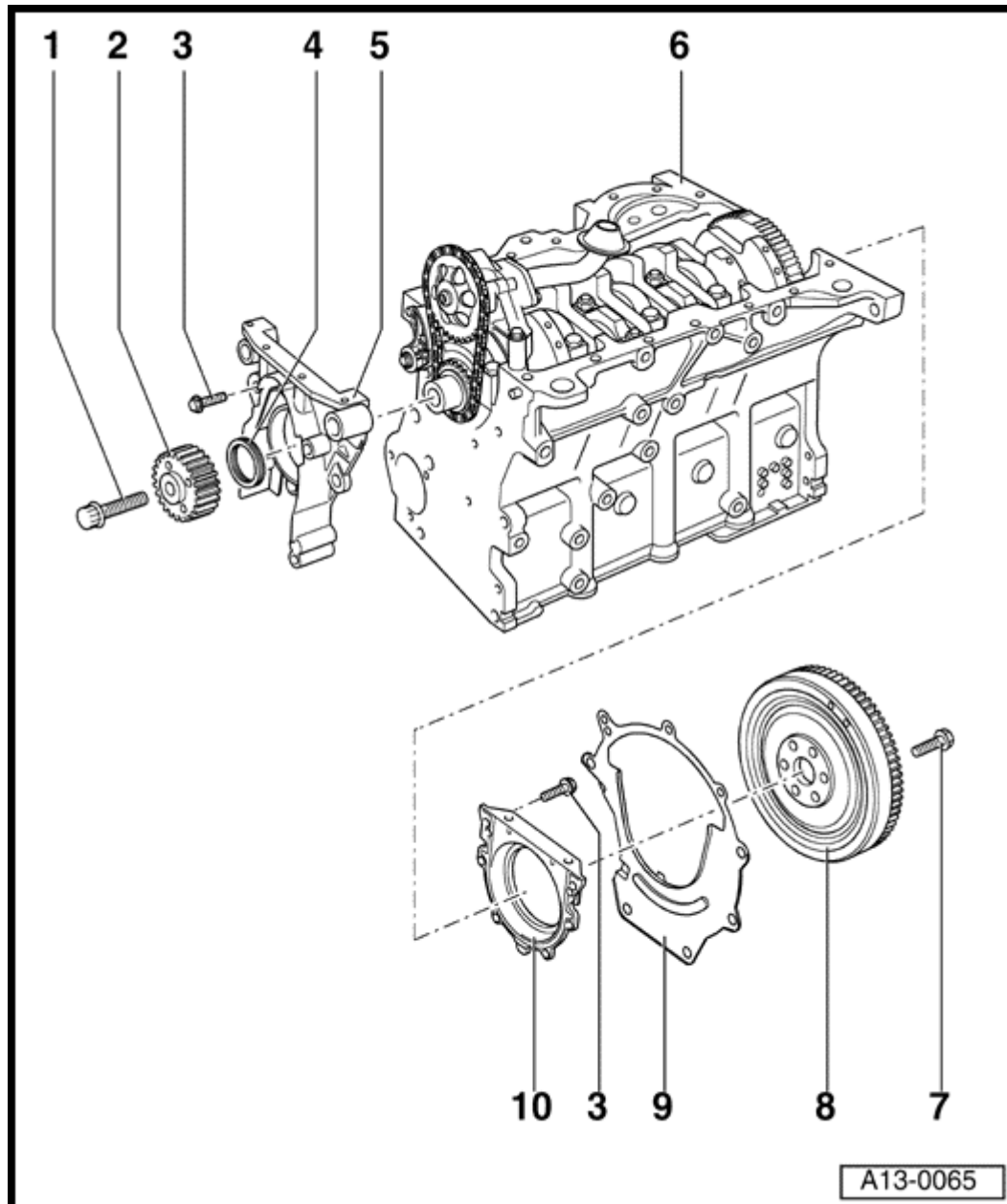


- Note position of pointer - 2 - (using mirror).
- Tension toothed belt with firm thumb pressure.
  - Notch - 1 - and indicator - 2 - must move apart.
- Release thumb pressure on toothed belt.
  - Tensioning roller must move back to its initial position (notch - 1 - and indicator - 2 - align again).
  - Tension roller must return to initial position
  - With engine cold to warm to the touch; notch - 1 - and pointer - 2 - must be across from one another

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Sealing flange and flywheel/drive plate, removing and installing (Page 13-19)



#### Notes:

For clutch repairs:

⇒ [5 - Speed manual transmission 02J; Repair group 30](#)

1 - 90 Nm (66 ft lb) +1 /4 turn (90 ° ) further

- Replace

♦ To loosen and tighten: counterhold with 3415

2 - Crankshaft toothed belt sprocket

3 - 15 Nm (11 ft lb)

4 - Oil seal

♦ Replacing ⇒ [Page 13-21](#)

## **5 - Sealing flange**

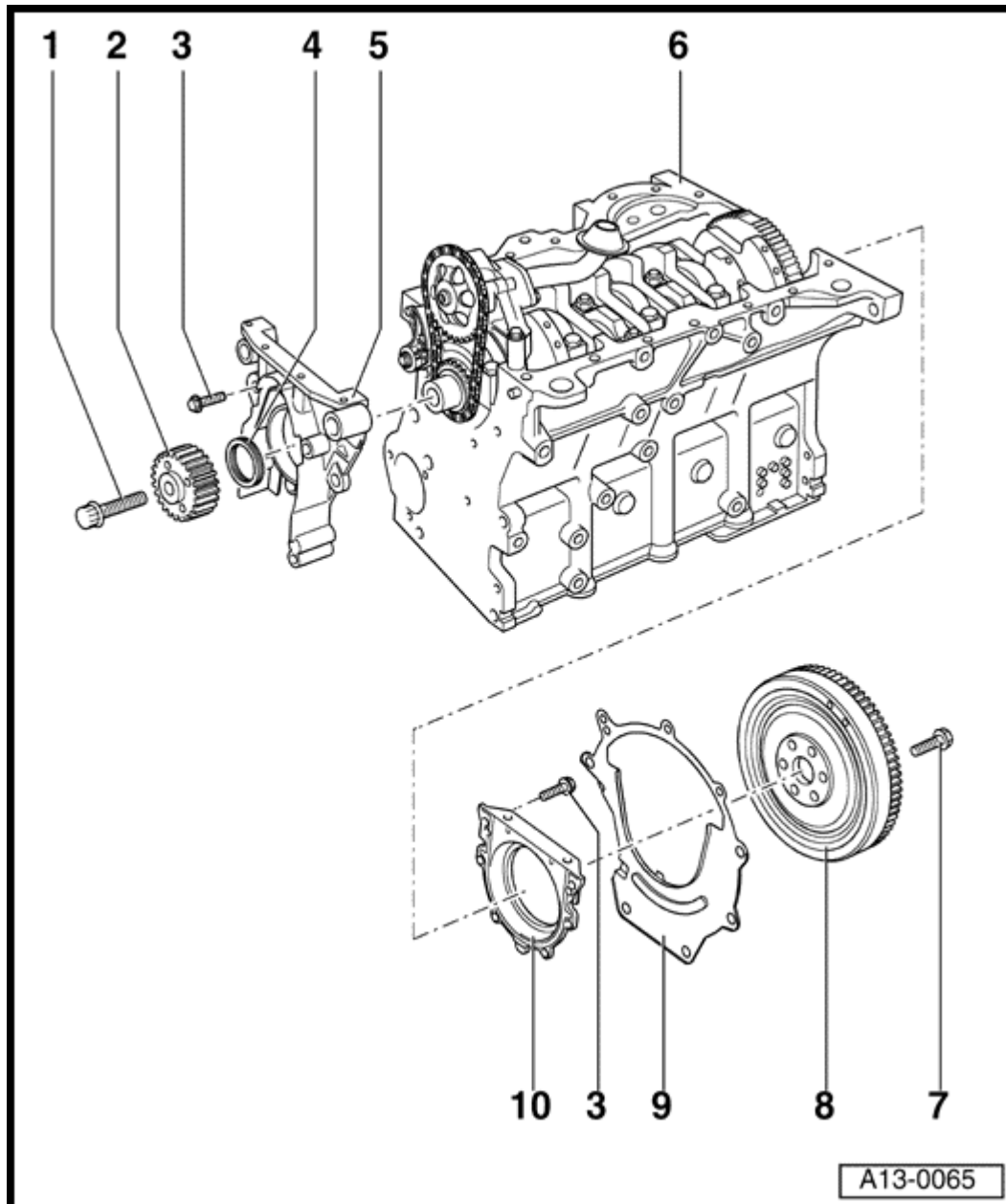
## **6 - Engine block**

- ♦ Crankshaft, removing and installing ⇒ [Page 13-32](#)
- ♦ Pistons and conrods: Disassembly and assembly, ⇒ [Page 13-36](#)

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Sealing flange and flywheel/drive plate, removing and installing (Page 13-20)



**7 - 60 Nm (44 ft lb) + 1 / 4 turn (90 ° ) further**

- Replace

#### **8 - Flywheel/drive plate**

- ♦ Flywheel: remove and install with 3067 counter - hold
- ♦ Drive plate: removing and installing ⇒ [Page 13-29](#)

#### **9 - Intermediate plate**

- ♦ Must be located on dowel sleeves
- Do not damage/bend when assembling

#### **10 - Sealing flange with oil seal**

- Only replace complete

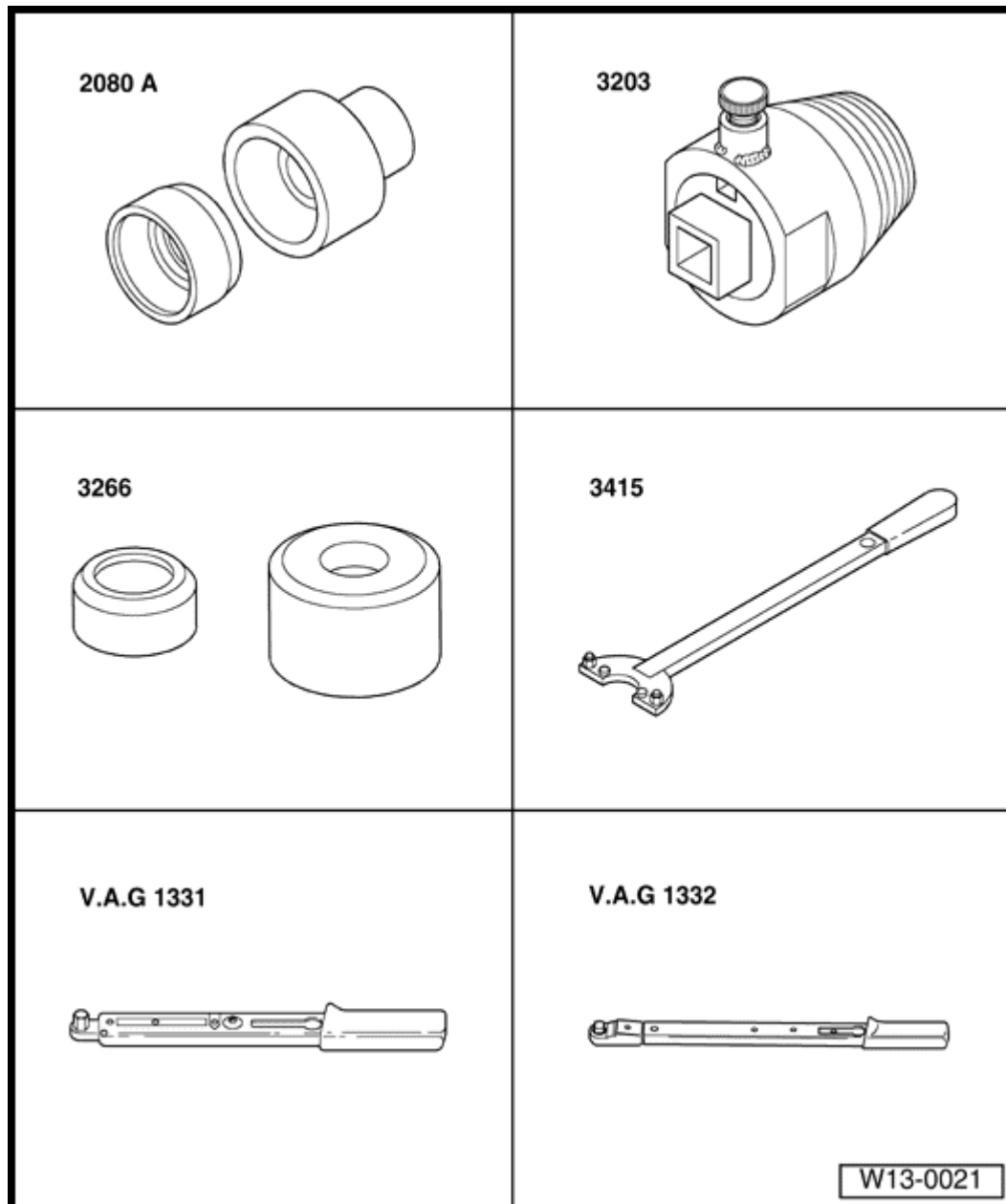
- Lightly oil lip on seal
- Install new sealing flange with guide sleeve (guide sleeve not removed from gasket before removing)

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Sealing flange and flywheel/drive plate, removing and installing (Page 13-21)

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### Crankshaft oil seal (pulley end), replacing

Special tools, workshop equipment, test and measuring appliances and auxiliary items required

- ◆ 2080 A sleeve
- ◆ 3203 Oil seal extractor
- ◆ 3266 Press fit sleeve
- ◆ 3415 Counter support
- ◆ VAG 1331 Torque wrench 5 to 50 Nm (3.7 to 37 ft lb)
- ◆ VAG 1332 Torque wrench 40 to 200 Nm (30 to 148 ft lb)

## Volkswagen New Beetle

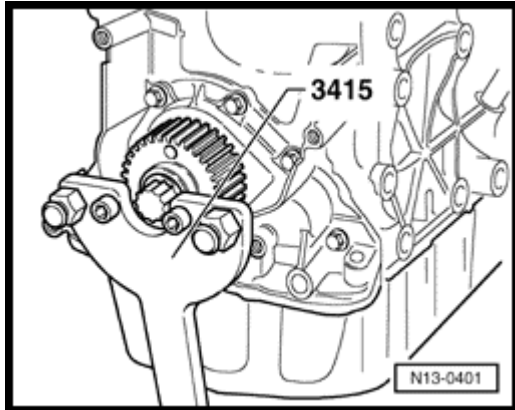
### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Sealing flange and flywheel/drive plate, removing and installing (Page 13-22)

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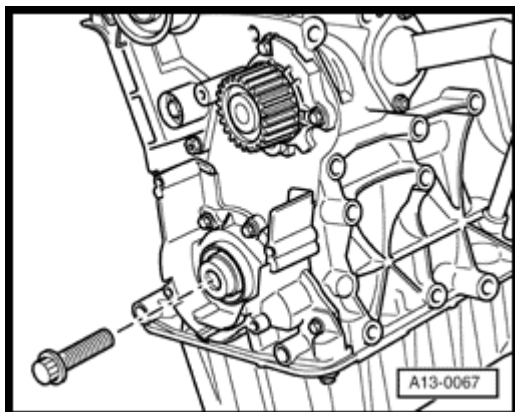
#### Crankshaft oil seal (pulley end), removing

- Remove ribbed belt ⇒ [Page 13-8](#) .
- Remove toothed belt ⇒ [Page 13-11](#) .



▲

- Remove crankshaft toothed belt sprocket by counterholding sprocket with 3415.



▲

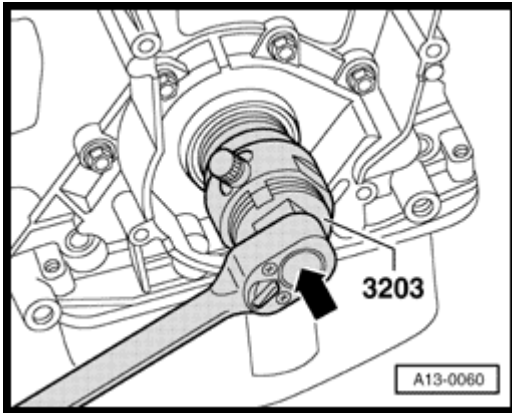
- To guide seal extractor, screw center bolt into crankshaft onto stop by hand.
- Unscrew inner part of oil seal extractor 3203 nine turns (approx. 20 mm) out of the outer part and lock with knurled screw.

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Sealing flange and flywheel/drive plate, removing and installing (Page 13-23)

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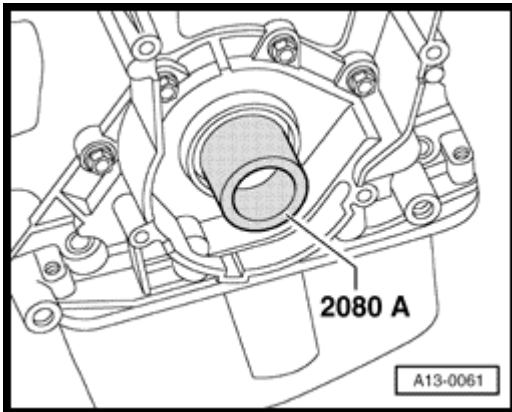


**A**

- Lubricate threaded head of oil seal extractor 3203, place it in position and exerting firm pressure screw it as far as possible into oil seal.
- Loosen knurled screw and turn inner part against crankshaft until the oil seal is pulled out.

#### **Crankshaft oil seal (pulley end), installing**

- Lightly oil sealing lip of oil seal.



**A**

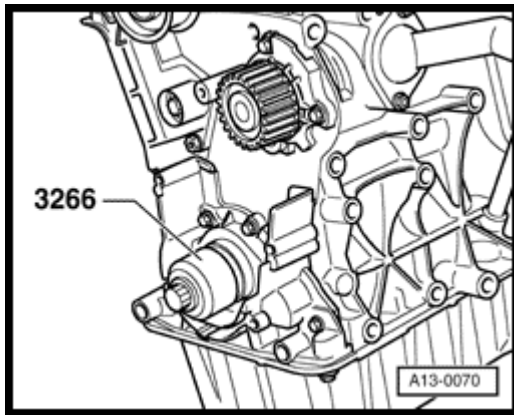
- Install guide sleeve from 2080 A onto crankshaft journal.
- Slide oil seal over guide sleeve.

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Sealing flange and flywheel/drive plate, removing and installing (Page 13-24)

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**A**

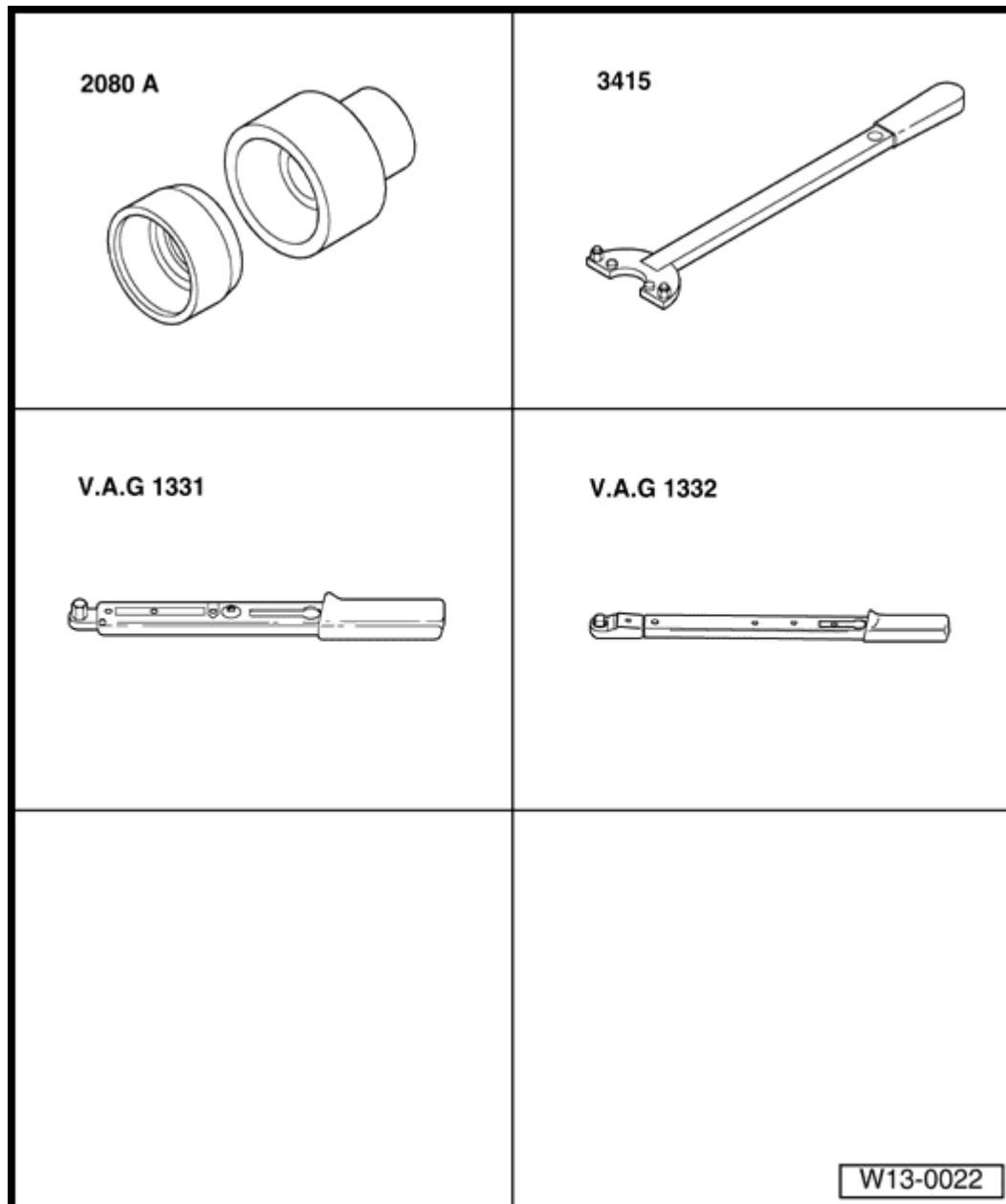
- Press in seal with press sleeve from 3266, using old center bolt for crankshaft toothed belt sprocket:
- Press in sleeve up to stop.
- Install crankshaft toothed belt sprocket and hold with 3415 counter - hold.
- Install toothed belt and adjust timing ⇒ [Page 13-11](#) .
- Install ribbed belt ⇒ [Page 13-8](#) .

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Sealing flange and flywheel/drive plate, removing and installing (Page 13-25)

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### Sealing flange (front), removing and installing

Special tools, workshop equipment, test and measuring appliances and auxiliary items required

- ◆ 2080 A sleeve
- ◆ 3415 Counter support
- ◆ VAG 1331 Torque wrench 5 to 50 Nm (3.7 to 37 ft lb)
- ◆ VAG 1332 Torque wrench 40 to 200 Nm (30 to 148 ft lb)
- ◆ Hand drill w/ plastic brush insert
- ◆ D176404 A2 Silicone sealant
- ◆ Flat scraper

## Volkswagen New Beetle

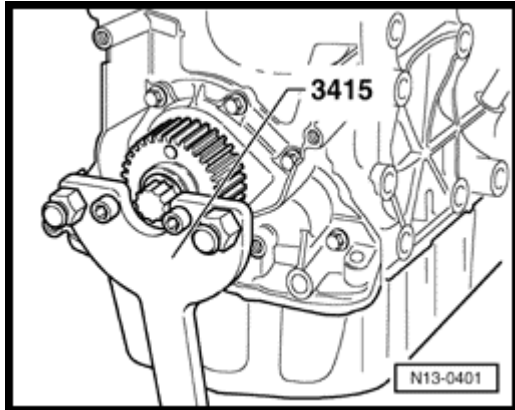
### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Sealing flange and flywheel/drive plate, removing and installing (Page 13-26)

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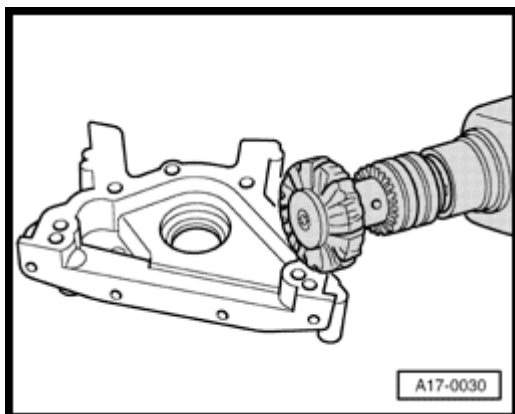
##### Sealing flange, removing

- Remove ribbed belt ⇒ [Page 13-8](#) .
- Remove toothed belt ⇒ [Page 13-11](#) .



##### A

- Remove crankshaft toothed belt sprocket by counterholding sprocket with 3415.
- Remove oil pan ⇒ [Page 17-7](#) .
- Unbolt front sealing flange.
- Remove sealing flange.
  - Release using light blows from rubber hammer, if necessary
- Remove sealant remnants on engine block with flat scraper.



##### A

- Remove sealant remains on sealing flange with a rotating plastic brush (wear protective goggles).
- Clean sealing surfaces, they must be oil and grease free.

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

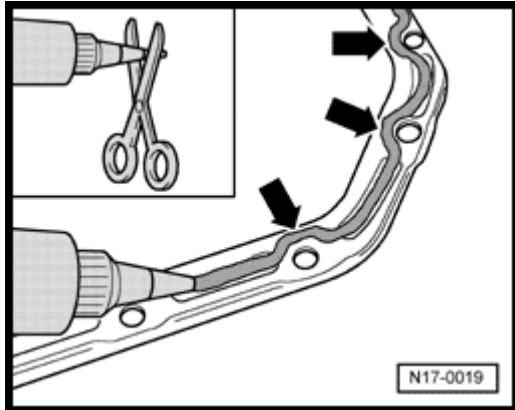
#### Sealing flange and flywheel/drive plate, removing and installing (Page 13-27)

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#### Sealing flange, installing

**Note:**

*Install the sealing flange within 5 minutes of applying the silicone sealant.*

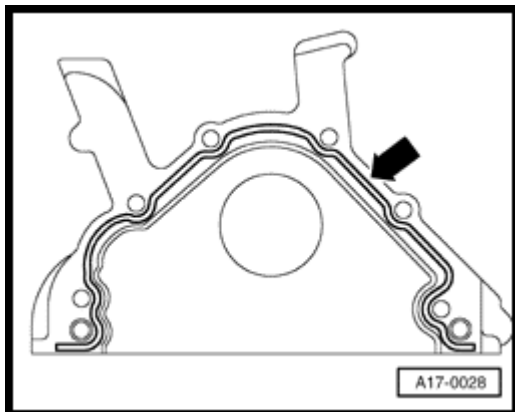


**A**

- Cut - off tube nozzle at forward mark (nozzle approx. 3 mm  $\varnothing$ )
- Apply silicone sealing compound, as shown, to clean oil pan sealing surface. Sealing compound bead must be:
  - ♦ Thickness of sealant bead - arrows - : 2 to 3 mm

**Note:**

*The sealing compound bead must not be thicker, otherwise excessive sealing compound will enter the sump and may block the oil suction pipe strainer.*



**A**

- Apply silicone sealant bead (as shown) to the clean sealing surface of the sealing flange.
- Immediately install sealing flange and lightly tighten all bolts.

**Note:**

*Use guide sleeve from 2080A to install sealing flange with oil seal already installed.*

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Sealing flange and flywheel/drive plate, removing and installing (Page 13-28)

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- Tighten sealing flange mounting bolts using alternate sequence.
  - Tightening torque: 15 Nm (11 ft lb)
- Install oil pan ⇒ [Page 17-7](#) .

**Note:**

*After installing, allow sealant to dry for approx. 30 minutes before filling with engine oil.*

- Install toothed belt and check timing ⇒ [Page 13-11](#) .
- Install ribbed belt ⇒ [Page 13-8](#) .

## Volkswagen New Beetle

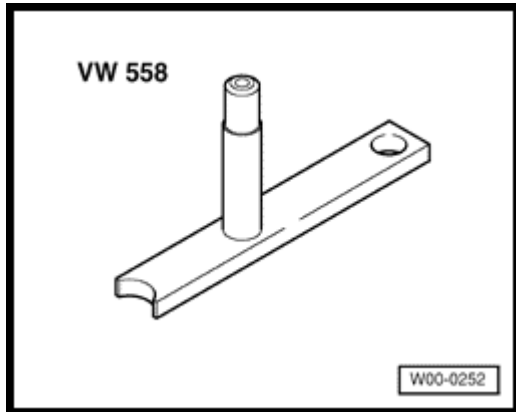
### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

Sealing flange and flywheel/drive plate, removing and installing (Page 13-29)

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#### Drive plate, removing and installing

Special tools, workshop equipment, testers, measuring instruments and auxiliary items required



A

- ◆ VW 558 Counterhold tool
- ◆ M8x45 Hex bolt and two M10 hex nuts
- ◆ Depth gauge

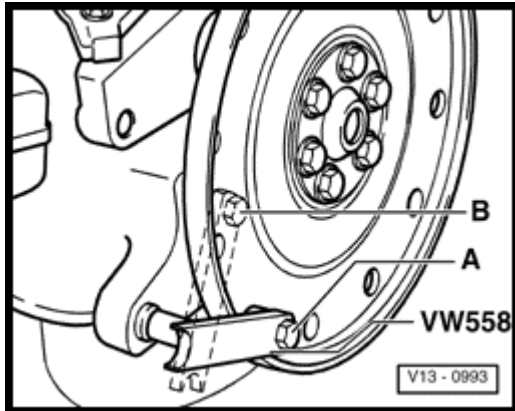
## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Sealing flange and flywheel/drive plate, removing and installing (Page 13-30)

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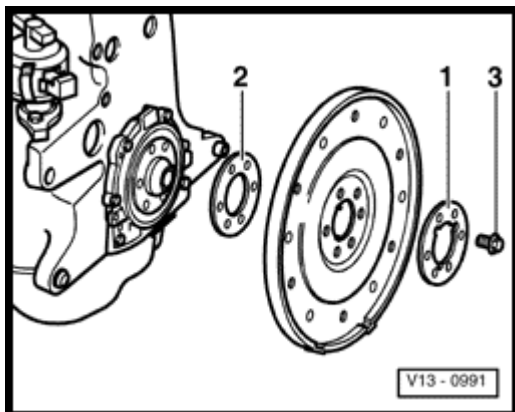
#### Drive plate, loosening and tightening



#### A

- Attach VW 558 counter - hold tool to the drive plate with an M8x45 hex bolt . Place two M10 hex nuts between counterhold and drive plate.
- Position of counterhold tool:
  - A - To loosen
  - B - To tighten

#### Installing drive plate

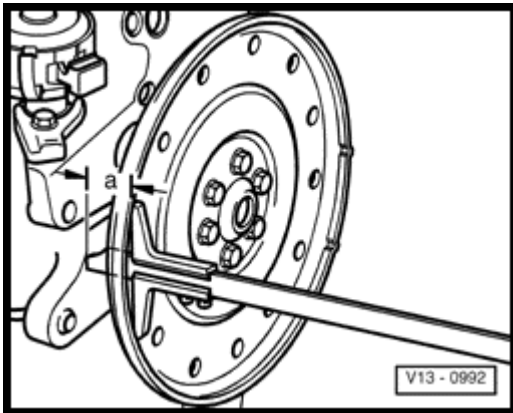


#### A

- Locate drive plate and backing plate with recesses - 1 - .
- Install new bolts - 3 - and tighten.
  - 30 Nm (22 ft lb)

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Sealing flange and flywheel/drive plate, removing and installing (Page 13-31)**

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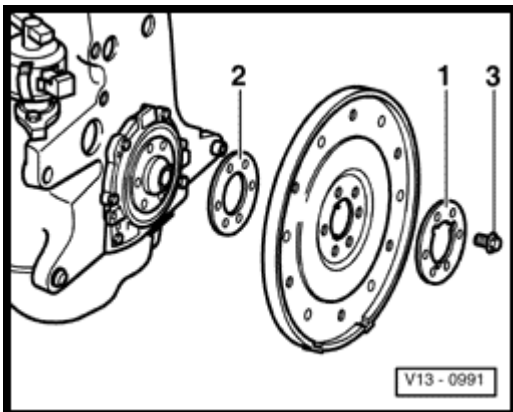
**A**

- Check dimension - a - at three points and calculate average.
  - Specification: 19.5 to 21.1 mm

**Note:**

*Because of the hole through the drive plate it is measured on the milled surface of the engine block*

If specification not obtained:

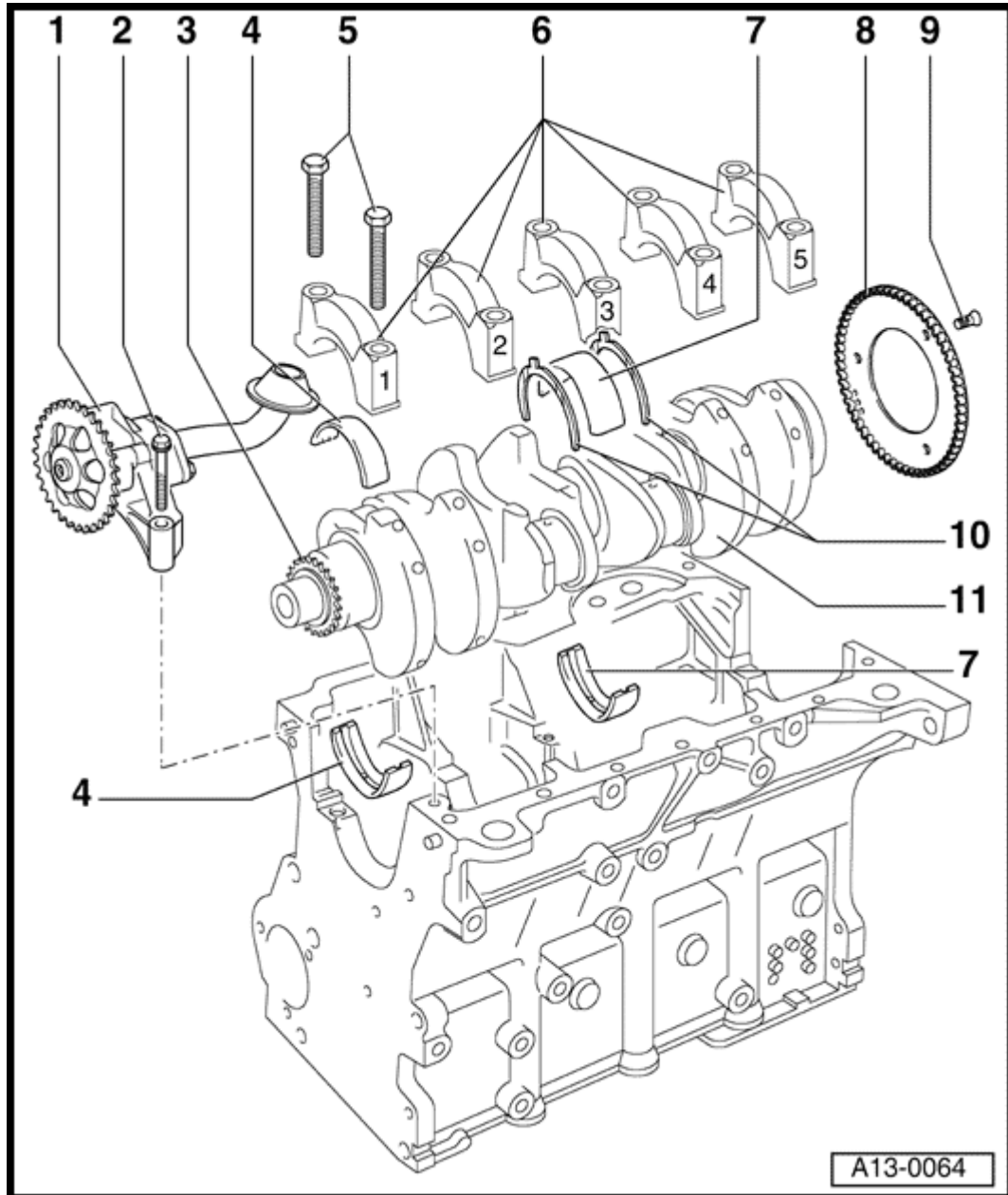


**A**

- Remove drive plate again and install shim - 2 - .
- Again tighten bolts - 3 -
  - 30 Nm (22 ft lb)
- Tighten bolts to 60 Nm (44 ft lb) and turn 90° (1/4 turn) further (can be done in several stages).

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Crankshaft, removing and installing (Page 13-32)**

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**Notes:**

*Attach engine to VW 540 engine bracket on assembly stand when disassembling and assembling engine.*

**1 - Oil pump**

- ◆ Removing and installing ⇒ [Page 17-1](#)

**2 - 15 Nm (11 ft lb)**

**3 - Chain sprocket**

- ◆ for oil pump drive

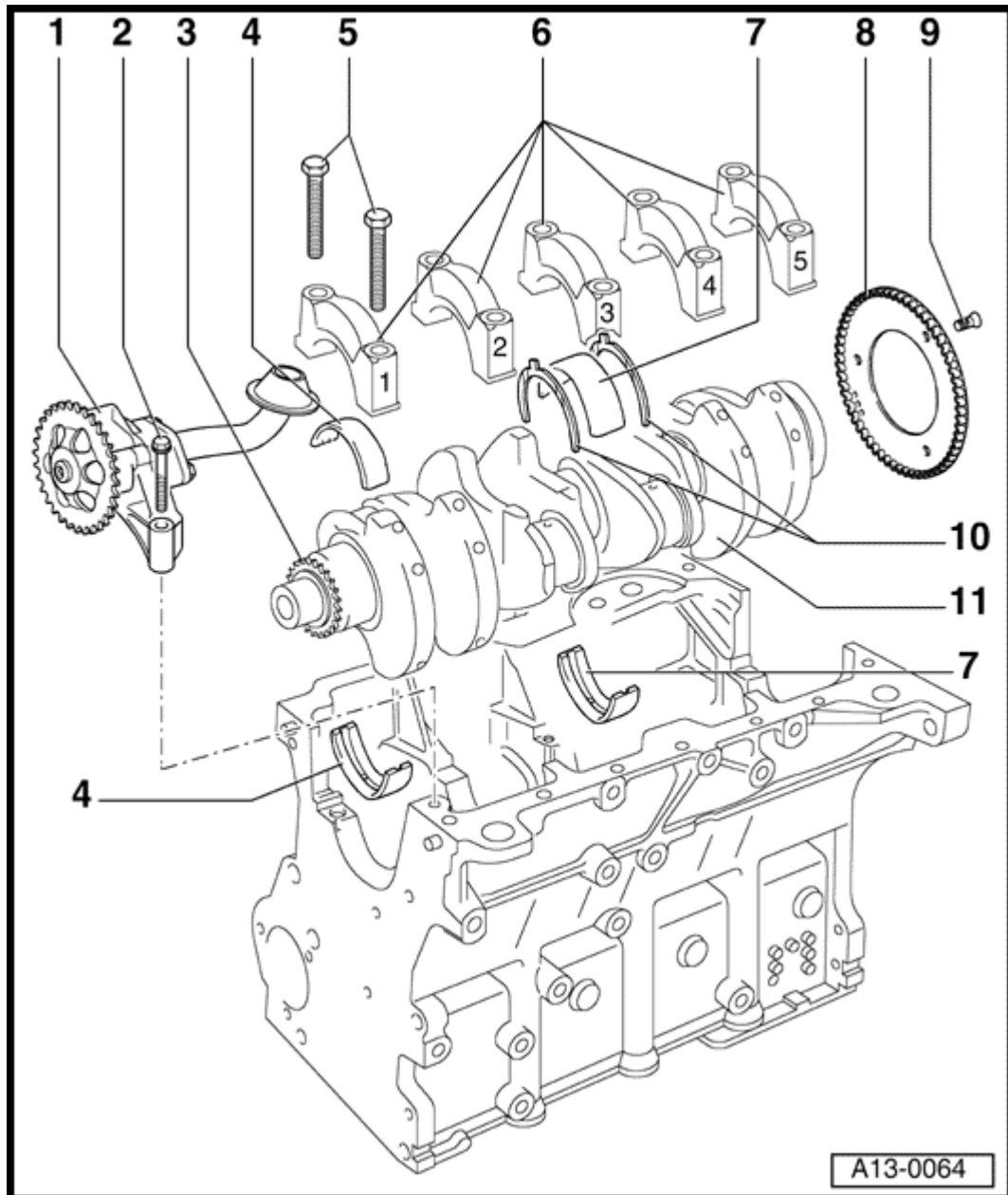
**4 - Bearing caps 1, 2, 4 & 5**

- ◆ for bearing cap without oil groove
- ◆

for cylinder block with oil groove

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Crankshaft, removing and installing (Page 13-33)**

---



**5 - 65 Nm (48 ft lb) + 90 ° (1 /4 turn) further**

- Replace

◆ Threaded along complete length (screw)

- Tighten to 65 Nm (48 ft lb) when measuring radial clearance

**6 - Bearing cap**

◆ Bearing cap 1: Pulley end

◆ Bearing cap 3 with recesses for thrust washers

◆ Bearing shell retaining lugs cylinder block/bearing cap must be on the same side

**7 - Bearing shell 3**

◆ for bearing cap without oil groove

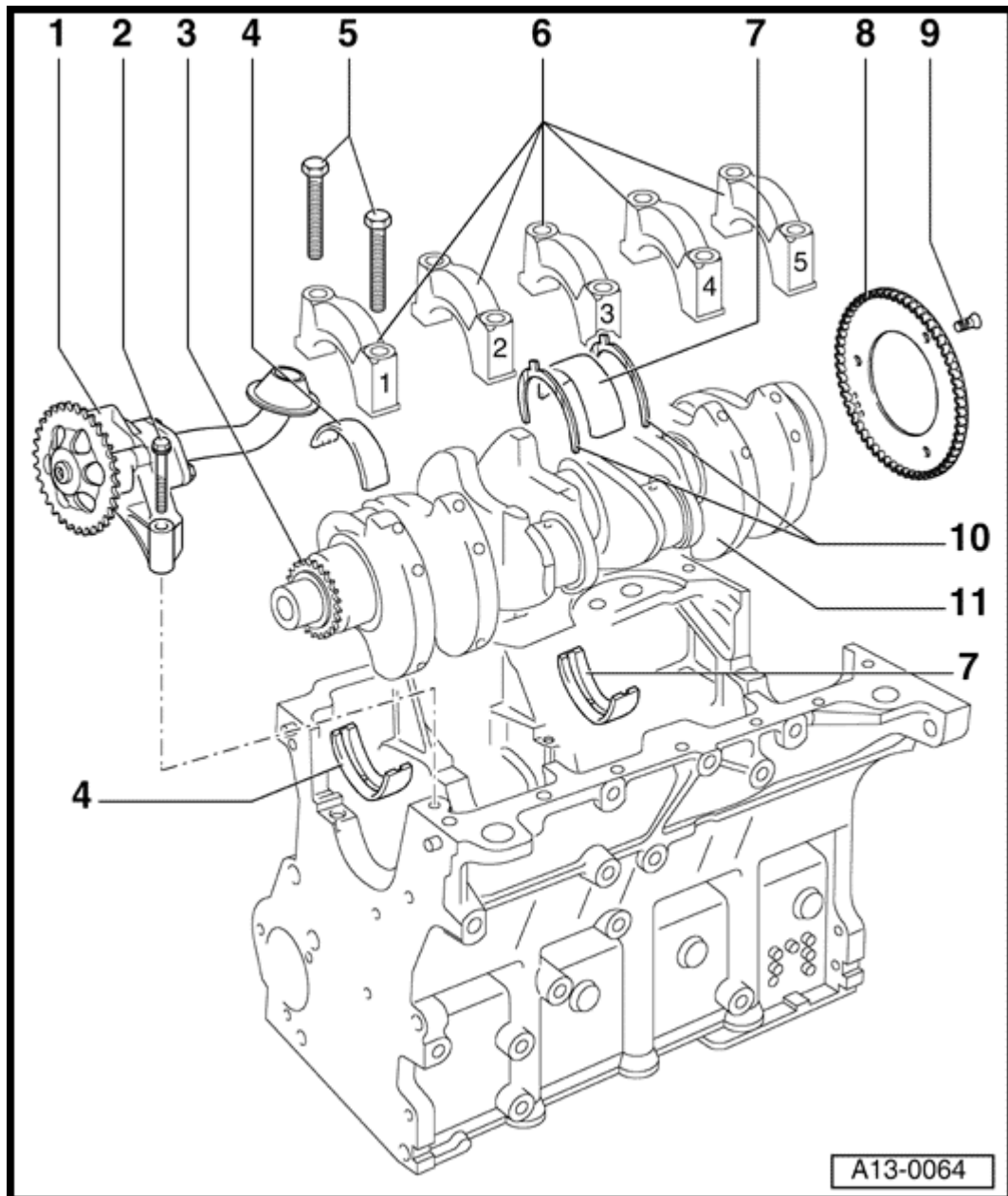
- ◆ for cylinder block with oil groove
- Do not interchange used bearing shells (mark)

### **8 - Sensor wheel**

- Replace
  - ◆ for engine speed sensor G28
  - ◆ Can only be installed in one position, holes are off - set.

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Crankshaft, removing and installing (Page 13-34)**

---



**9 - 10 Nm (7 ft lb) + 1 / 4 turn (90 ° ) further**

- Replace

**10 - Thrust washer**

♦ for bearing 3 bearing cap

- Note installation arrangement

**11 - Crankshaft**

♦ Axial clearance new: 0.07 to 0.23 mm Wear limit: 0.30 mm

♦ Check radial clearance with Plastigage New: 0.01 to 0.04 mm Wear limit: 0.15 mm

- Do not rotate crankshaft when checking radial clearance

♦ Crankshaft dimensions ⇒ [Page 13-35](#)

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Crankshaft, removing and installing (Page 13-35)**

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**Crankshaft dimensions**

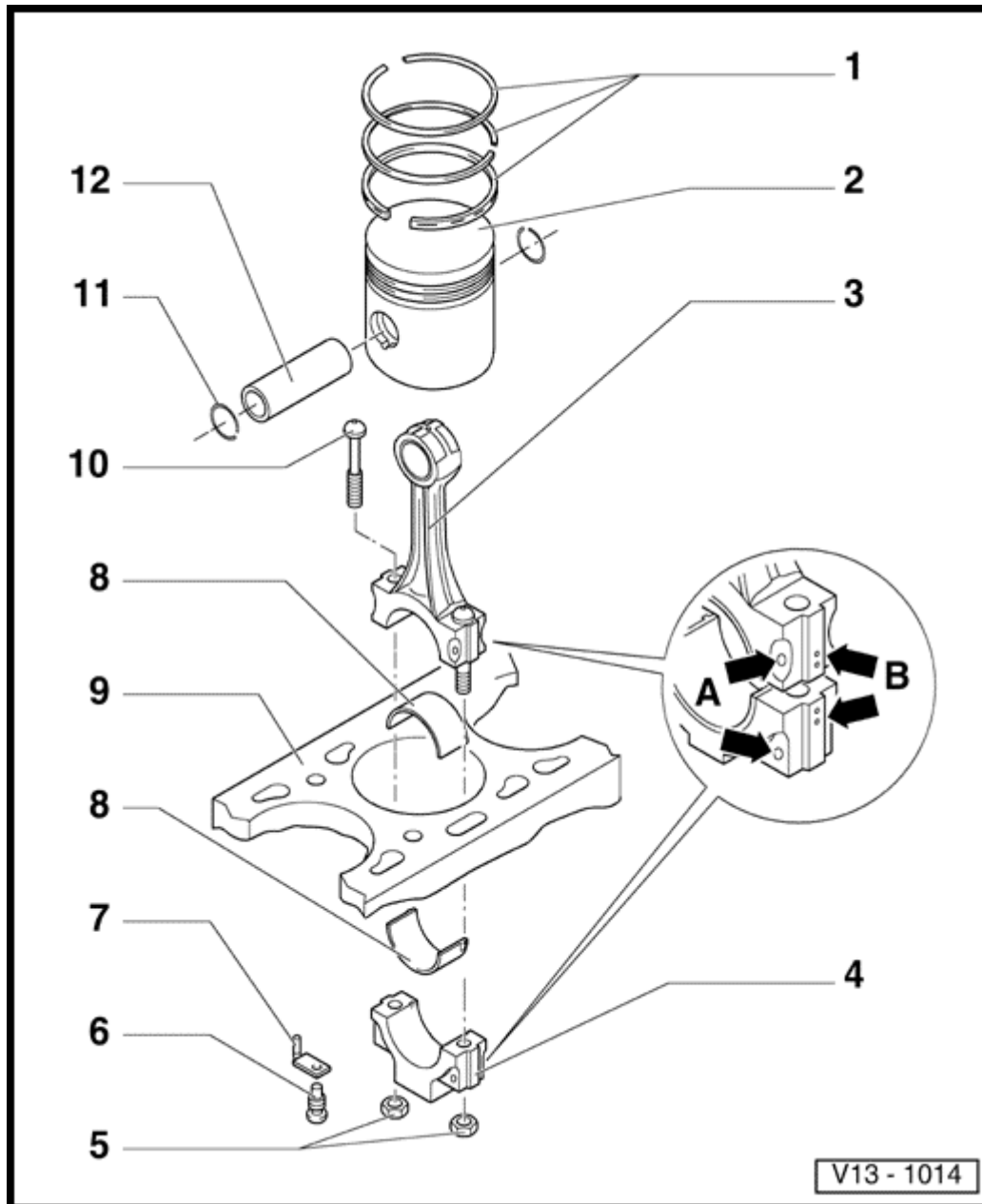
(in mm)

<b>Honing dimension</b>	<b>Main journal -Ø</b>	<b>Conrod journal-Ø</b>
Basic dimension	-0.017 54.00 -0.037	-0.022 47.80 -0.042
1st undersize	-0.017 53.75 -0.037	-0.022 47.55 -0.042
2nd undersize	-0.017 53.50 -0.037	-0.022 47.30 -0.042
3rd undersize	-0.017 53.25 -0.037	-0.022 47.05 -0.042

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Pistons and connecting rods, disassembling and assembling (Page 13-36)



#### 1 - Piston ring

- Offset gaps by  $120^{\circ}$
- Remove and install using piston ring pliers
  - ◆ "TOP" faces piston crown
  - ◆ Ring gap, checking ⇒ [Fig. 1](#)
  - ◆ Ring to groove clearance checking ⇒ [Fig. 2](#)
  - ◆ 2 or 3 part oil scraper ring: mixed installations permitted

#### 2 - Piston

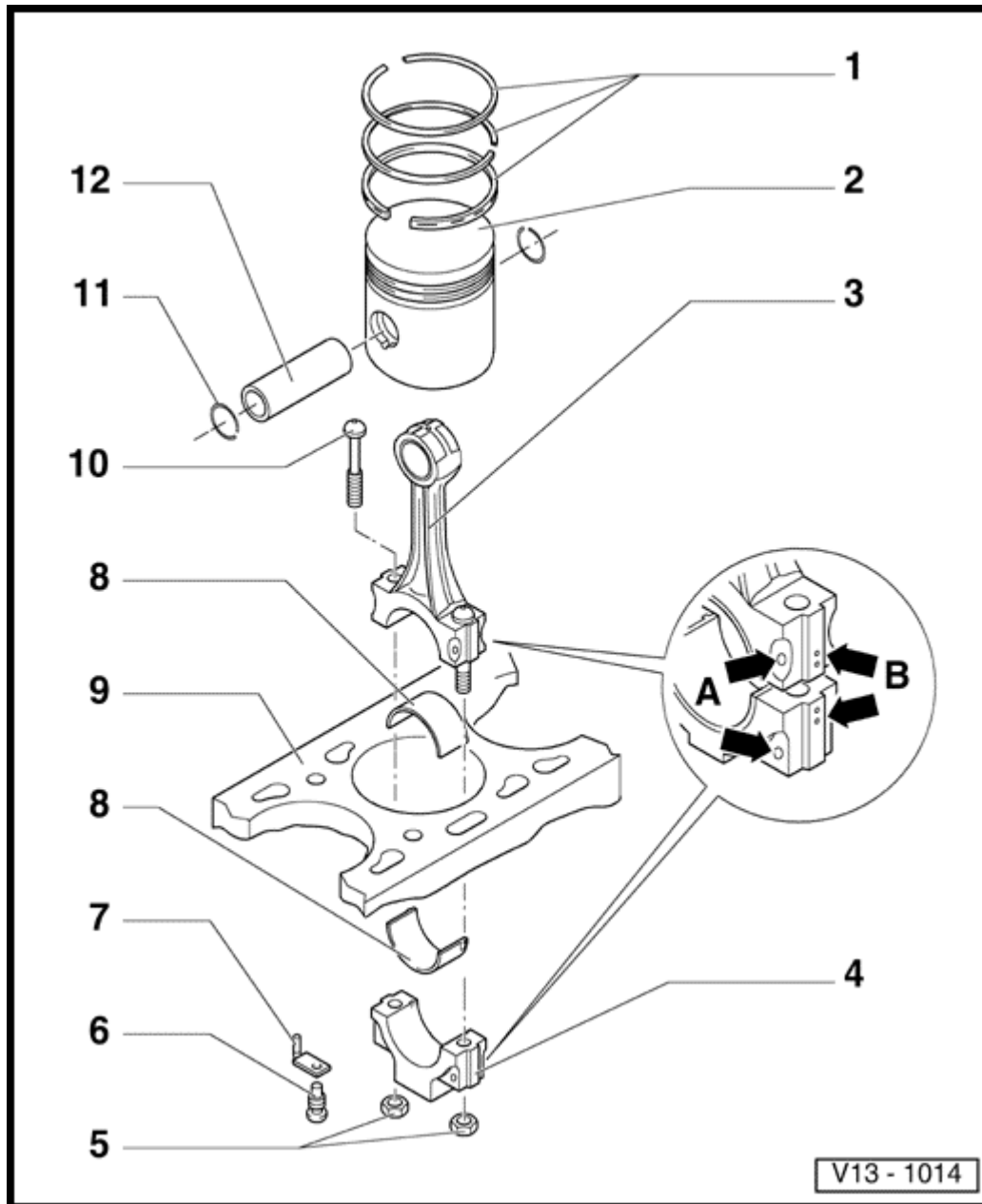
- ◆ Checking ⇒ [Fig. 3](#)
- Mark installation position and cylinder number

- ◆ Arrow on piston crown points to pulley end
- Install using piston ring clamp

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Pistons and connecting rods, disassembling and assembling (Page 13-37)



#### **3 - Connecting rod**

- Only replace as a set
- Mark cylinder number - B -
  - ♦ Installation position: Marking - A - faces towards pulley end

#### **4 - Connecting rod bearing cap**

- Note installation position

#### **5 - 30 Nm (22 ft lb) + 1 / 4 turn (90 ° ) further**

- Replace
- Oil threads and contact surfaces
  - ♦ To measure radial clearance tighten to 30 Nm (22 ft lb) but no further

## **6 - Pressure relief valve**

- ◆ 27 Nm (20 ft lb)
- ◆ Opening pressure: 2.5 to 3.2 bar

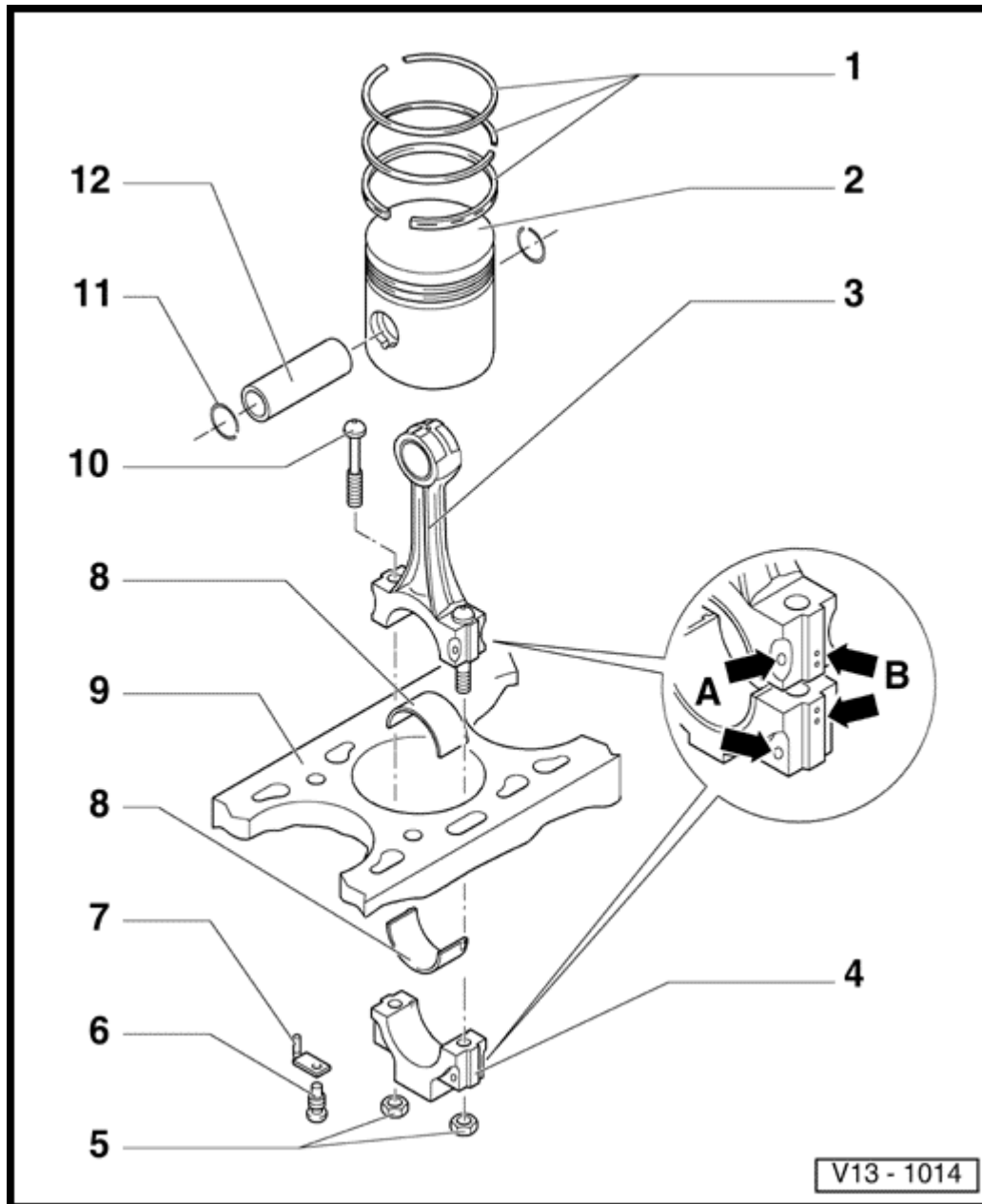
## **7 - Oil spray jet**

- ◆ for piston cooling

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Pistons and connecting rods, disassembling and assembling (Page 13-38)



#### 8 - Bearing shell

- Note installation position
- Do not interchange used bearing shells
- Ensure retaining lugs fit tightly in recesses
  - ◆ Axial clearance New: 0.05 to 0.31 mm Wear limit: 0.37 mm
  - ◆ Check radial clearance with Plastigage:
    - New: 0.01 to 0.06 mm
    - Wear limit: 0.12 mm
  - Do not rotate crankshaft when checking radial clearance
  - ◆ with oil hole for piston bolt lubrication

## **9 - Engine block**

- ◆ Checking cylinder bores ⇒ [Fig. 4](#)
- ◆ Piston and cylinder dimensions ⇒ [Page 13-41](#)

## **10 - Connecting rod bolt**

## **11 - Circlip**

## **12 - Piston pin**

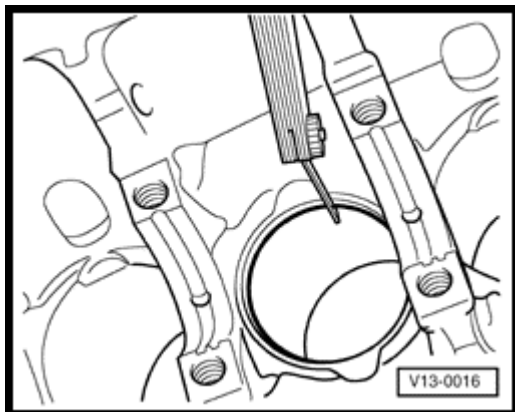
- ◆ If difficult to remove, heat piston to 60 ° C (140 ° F)
- Remove and install with VW 222a

**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Pistons and connecting rods, disassembling and assembling (Page 13-39)**

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**Special tools, testers, measuring instruments and auxiliary items required**

- ◆ Feeler gauges
- ◆ Internal dial gauge 50 to 100 mm
- ◆ Micrometer 75 to 100 mm



**A**

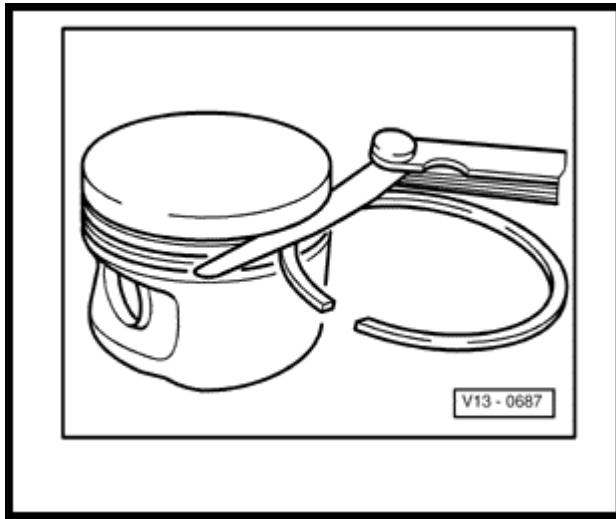
**Fig. 1 Piston ring gap, checking**

- Squarely push down on piston ring from above to approx. 15 mm from lower end of cylinder bore.

Piston ring	Gap	
	New	Wear limit
Compression rings mm	0.20 to 0.40	0.8
Oil scraper ring mm	0.25 to 0.50	0.8

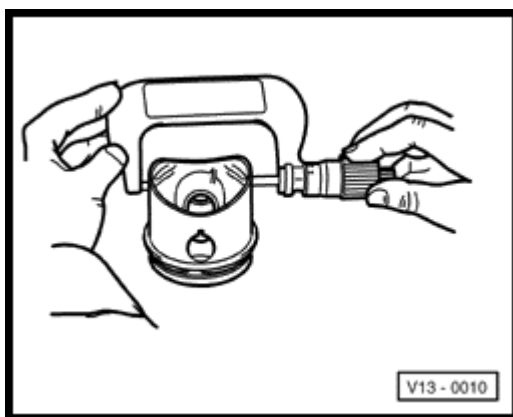
**Volkswagen New Beetle**  
**2.0 Liter 4-cyl General, Engine (Engine Code AEG)**  
**Pistons and connecting rods, disassembling and assembling (Page 13-40)**

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**Fig. 2 Ring to groove clearance, checking**  
Clean groove before check.

Piston ring:	Clearance:		
		New	Wear limit
Compression rings	mm	0.06 to 0.09	0.20
Oil scraper ring	mm	0.03 to 0.06	0.15



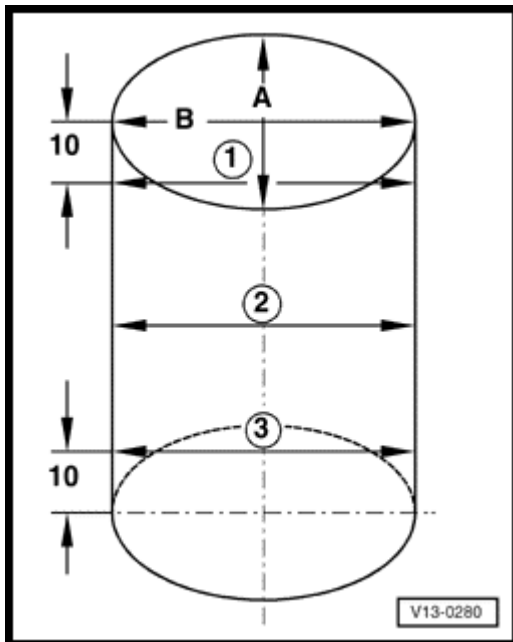
**Fig. 3 Piston, checking**

- Measure pistons approx. 10 mm from the lower edge of skirt, at 90° angle to the piston pin axis.
- Deviation from nominal dimension max. 0.04 mm

## Volkswagen New Beetle

### 2.0 Liter 4-cyl General, Engine (Engine Code AEG)

#### Pistons and connecting rods, disassembling and assembling (Page 13-41)



**Fig. 4 Cylinder bores, checking**

- Measure bore at 3 locations in both directions - A - across the engine and - B - in line with crankshaft.
- Use internal dial gauge 50 to 100 mm.
  - Deviation from nominal dimension max. 0.08 mm

**Note:**

*Do NOT measure the cylinder bores when the engine block is mounted on a repair stand using the VW 540 adapter bracket, inaccurate measurements will result due to the uneven bending of the engine block on the repair stand.*

### Piston and cylinder dimensions

Honing dimension		Piston- $\varnothing$	Cylinder bore- $\varnothing$
Basic dimension	mm	82.465 <sup>1)</sup>	82.51
Stage I	mm	82.965 <sup>1)</sup>	83.01

<sup>1)</sup> Dimension without graphite coating (thickness 0.02 mm). The graphite coating wears away.