

Engine, disassembling and assembling

Note:

- *If large quantities of metal particles or abraded material are detected during engine repairs, it may be an indication for a damaged crankshaft or rod bearings. To prevent further damage, perform the following steps after the repair:*

- *Carefully clean oil passages*

- *Replace oil injection jets*

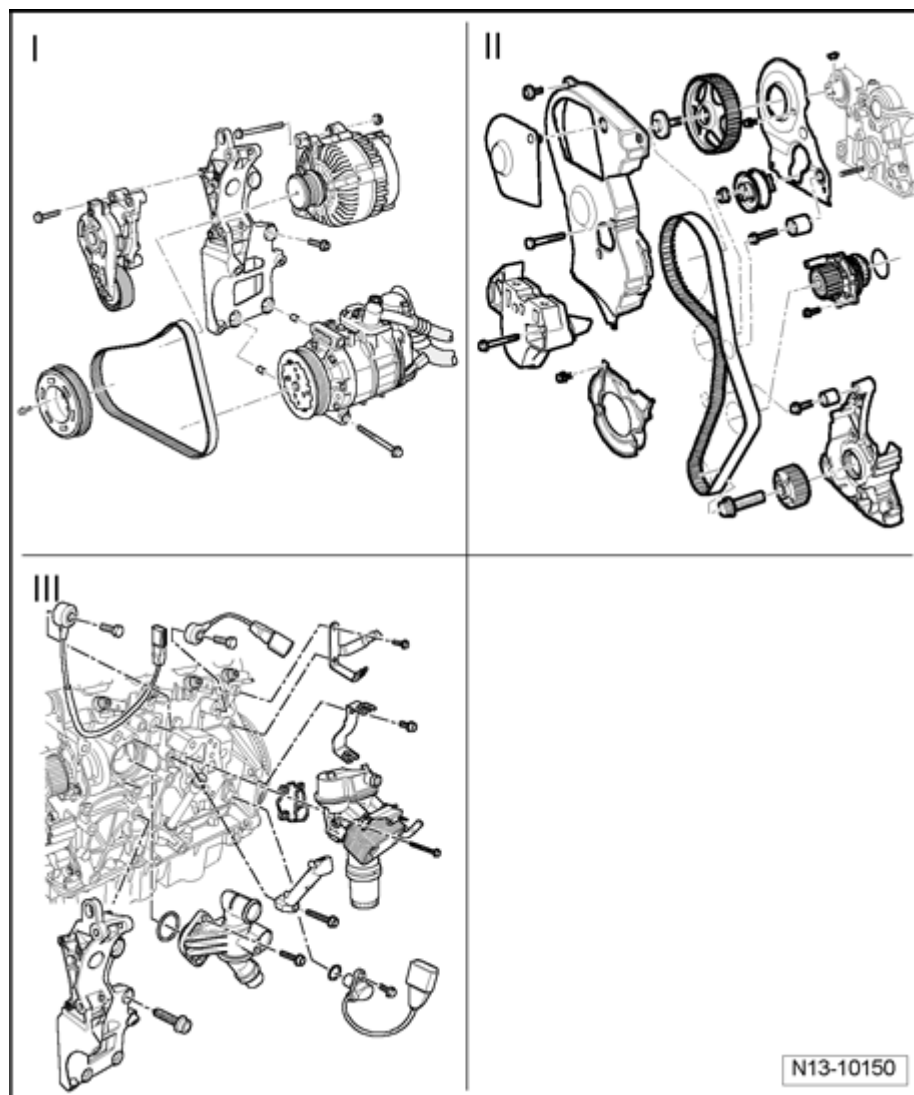
- *Replace oil cooler*

- *Oil filter, replacing*

Assembly overview ⇒ [13-1, Assembly overview](#) .

Ribbed belt, removing and installing ⇒ [13-1, Ribbed belt, removing and installing.](#) .

Assembly overview

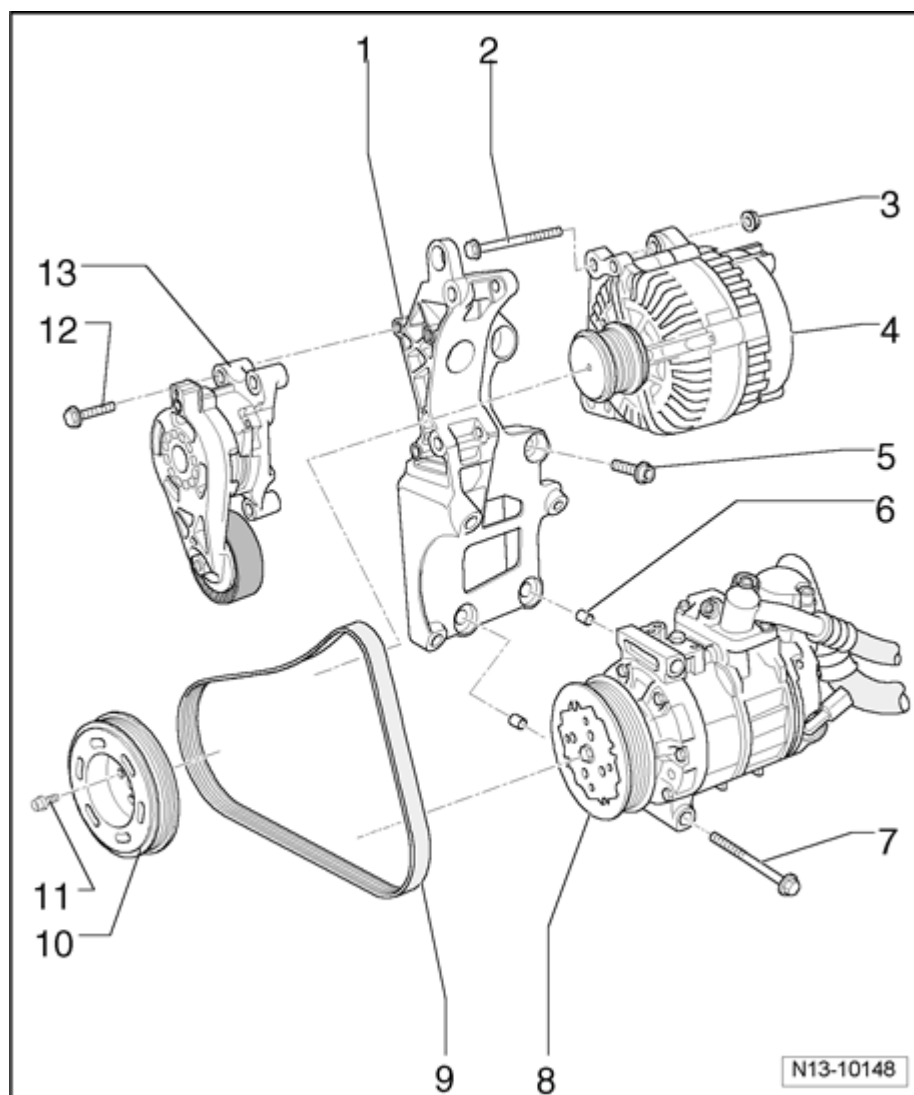


Part I ⇒ [13-1, Part I](#)

Part II ⇒ [13-1, Part II](#)

Part III ⇒ [13-1, Part III](#)

Part I



- **Bracket for assemblies**

- Observe tightening sequence ⇒ [13-1, Tightening sequence, support for additional assemblies](#)

- **23 Nm**

- **23 Nm**

- **Generator**

- Removing and installing

⇒ [Repair Manual, Electrical Equipment, Repair Group 27, Generator, removing and installing](#)

- To facilitate installing the generator, slightly drive back threaded bushings for retaining bolts on generator.

- **45 Nm**
 - Observe tightening sequence ⇒ [13-1, Tightening sequence, support for additional assemblies](#)
 - Insert with locking fluid.

- **Socket**
 - Qty. 2

- **25 Nm**
- **A/C compressor**
 - Removing and installing

⇒ *Repair Manual, Heating Air Conditioning, Repair Group 87, Servicing work on refrigerant circuit; removing and installing A/C compressor*

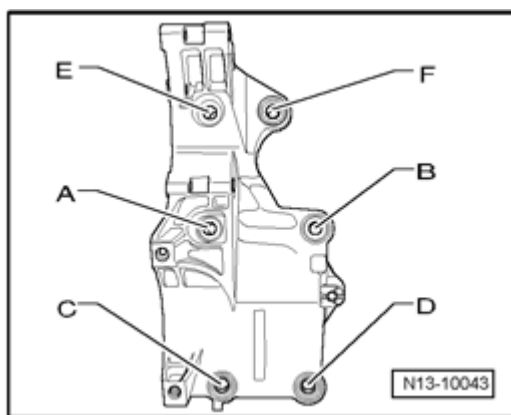
- **Ribbed belt**
 - Before removing, note direction of rotation using chalk or felt-tip marker
 - Checking for wear
 - Do not bend
 - Removing and installing ⇒ [13-1, Ribbed belt, removing and installing.](#)

- **Belt pulley**
 - For ribbed belt

- **10 Nm plus an additional 90°**
($1/4$ turn)
 - Replace

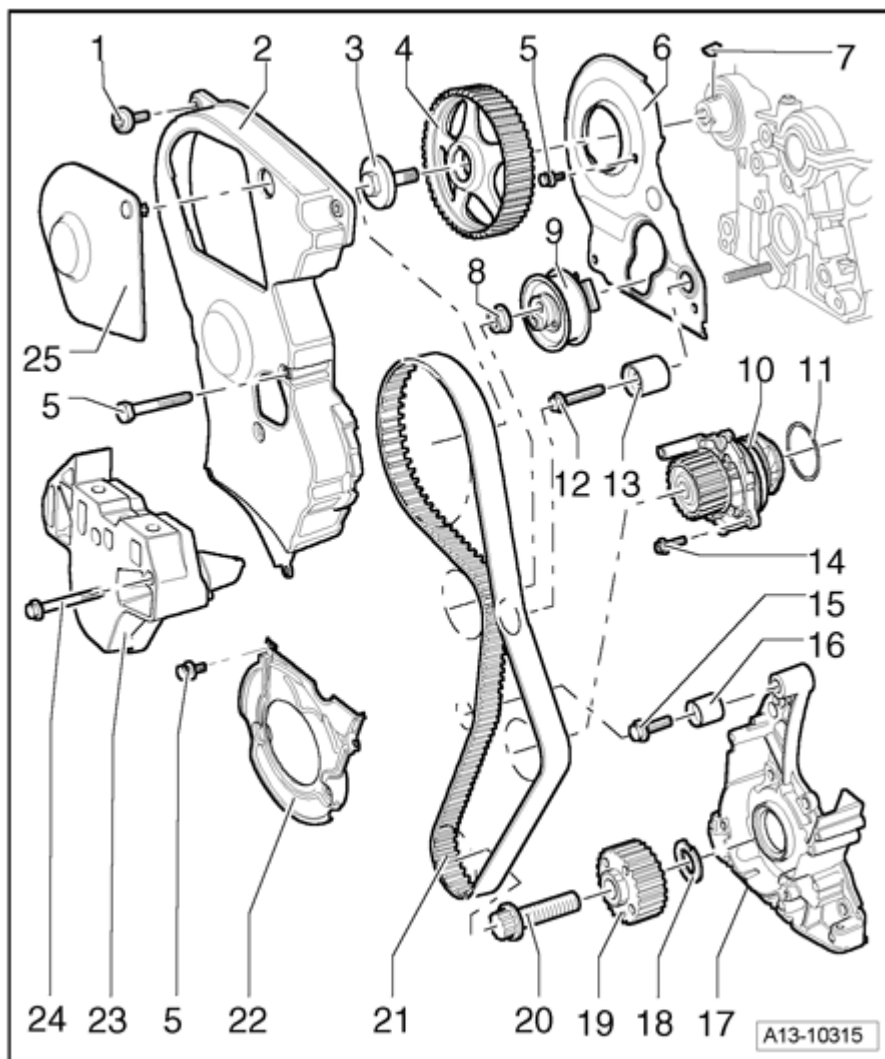
- **23 Nm**

- **Ribbed belt tensioner**
 - To release tension on ribbed belt, swing using open-end wrench.



Tightening sequence, support for additional assemblies

Part II



- 10 Nm
- Upper toothed belt cover
- 65 Nm
 - Use retainer 3036 for loosening and tightening
- Camshaft gear
 - Installation position secured by woodruff key
- 10 Nm
 - Insert with locking fluid
- Rear toothed belt guard
- Woodruff key

- Check for secure fitting

- **25 Nm**
- **Semi-automatic tensioning roller**
- **Coolant pump**
 - Removing and installing ⇒ [19-1, Coolant pump, removing and installing](#)

- **O-ring**
 - Replace

- **25 Nm**
- **Damper roller**
- **15 Nm**
- **35 Nm**
- **Damper roller**
- **Sealing flange**
- **Diamond disc**
 - Replace

- **Toothed belt gear for crankshaft**
 - Contact surface between toothed belt gear, diamond disc and crankshaft must be free of oil.
 - Installation only possible in one position

- **90 Nm plus an additional 90 ° (1 / 4 turn)**
 - Replace
 - Do not grease
 - Use retainer 3415 for

loosening and tightening

- **Toothed belt**

- Before removing, note direction of rotation using chalk or felt-tip marker
- Checking for wear

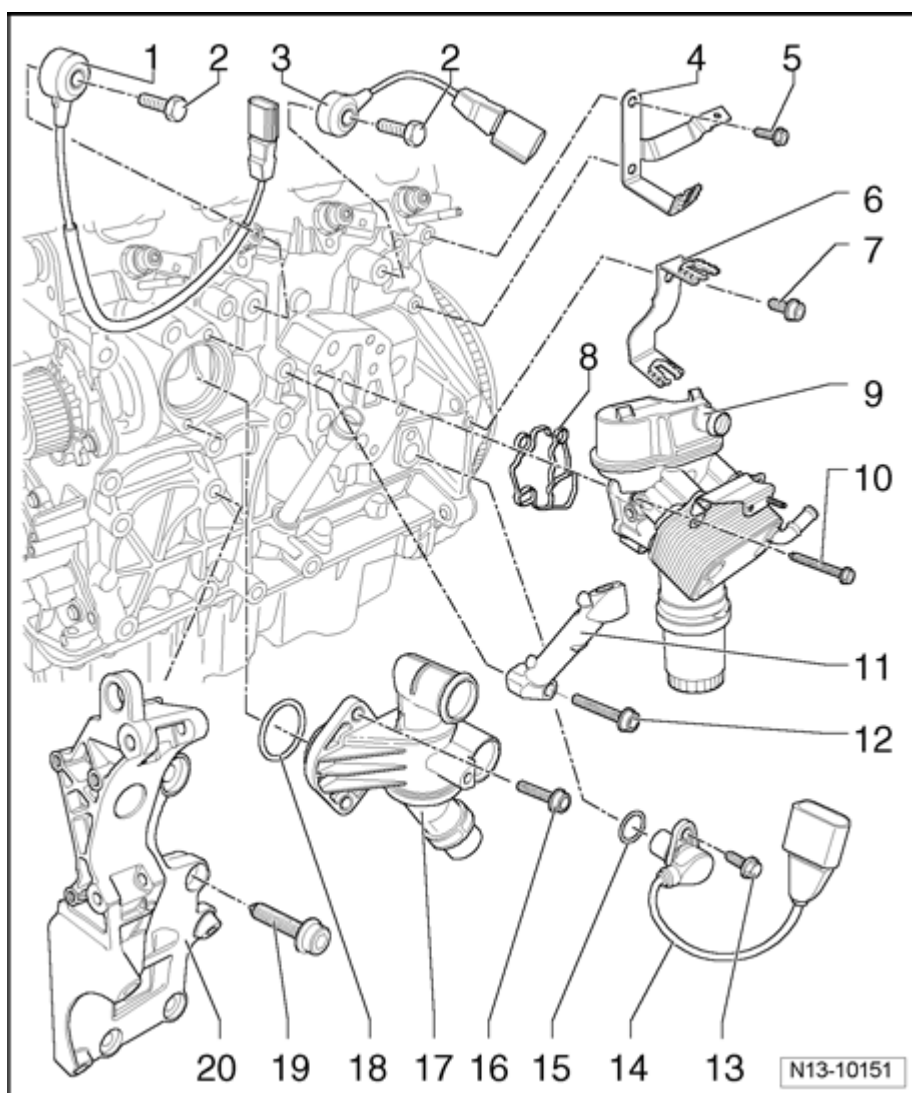
- **Lower toothed belt cover**

- **Engine bracket**

- 45 Nm

- **Cover for toothed belt guard**

Part III



- **Knock sensor 1 G61**

- Terminals are gold-plated

- **20 Nm**
 - Tightening torque affects function of Knock Sensor (KS)

- **Knock sensor 2 G66**
 - Terminals are gold-plated
 - To remove, oil filter bracket must be removed ⇒ [17-1, Oil filter bracket, removing and installing](#)

- **Cable bracket**
- **Bolt**
- **Cable bracket**
- **Bolt**
- **Gasket**
 - Replace

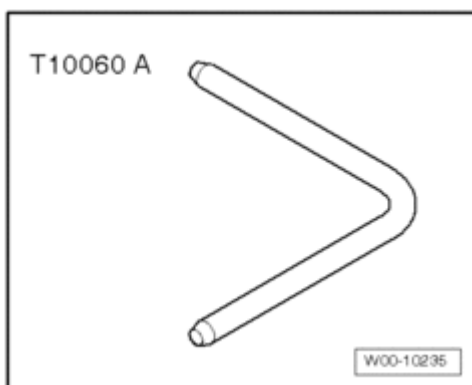
- **Oil filter bracket with attachments**
 - Disassembling and assembling ⇒ [17-1, Part 3 oil filter bracket](#)

- **15 Nm plus and additional $1/4$ turn (90 °)**
- **Intake manifold support**
- **Bolt**
- **10 Nm**
- **Engine speed (RPM) sensor G28**
- **Seal**
 - Replace

- 15 Nm
- **Coolant distribution housing with thermostat**
 - Removing and installing ⇒ [19-1, Coolant distribution housing with thermostat, removing and installing](#)
- **O-ring**
 - Replace
- 40 Nm
- **Bracket for assemblies**
 - Tightening sequence ⇒ [13-1, Tightening sequence, support for additional assemblies](#)

Ribbed belt, removing and installing.

Special tools, testers and auxiliary items required



- Locking Pin T10060A

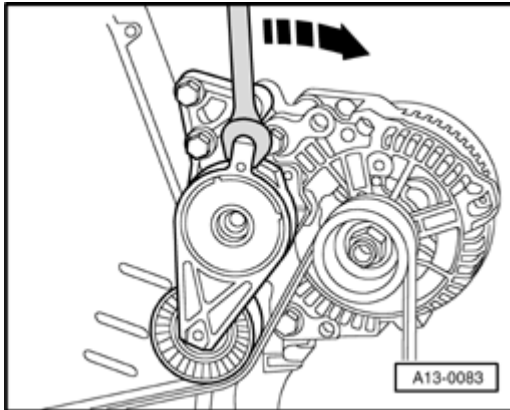
Removing ribbed belt

- Remove insulation pan

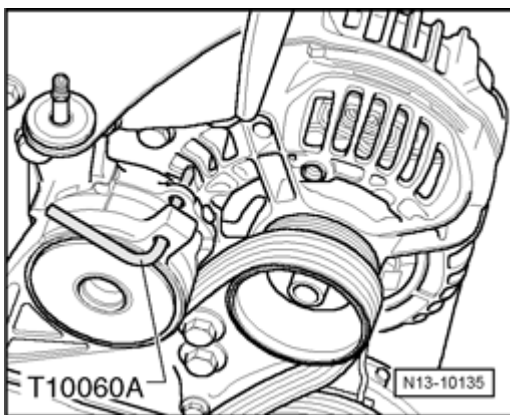
⇒ [Repair Manual, Body Exterior, Repair Group 50, Front](#)

body; noise insulation

- Mark rotational direction of ribbed belt.



- Move tensioner in direction of - **arrow** - to release tension on ribbed belt.



- Secure tensioning element using Locking Pin T10060A .
- Remove ribbed belt.

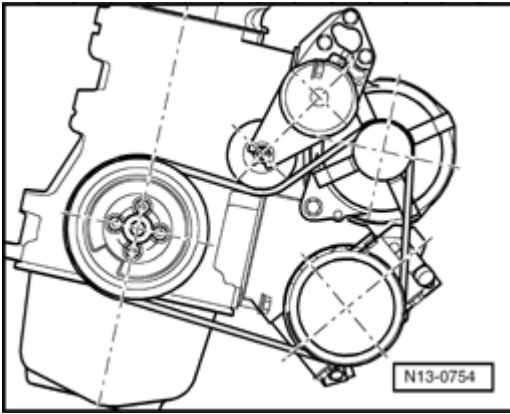
Install ribbed belt

- Installation is in reverse order of removal, note the following:

Note:

- *Note previously marked direction of rotation of ribbed belt and be sure that it is seated correctly on pulley.*
- *Lastly, install ribbed belt on A/C compressor.*

After finishing work, always:



- Start engine and check path of belt.



Sealing flange and flywheel/drive plate

Note:

- *Servicing clutch*

⇒ *Repair Manual, Manual Transmission, Repair Group 30, Clutch, servicing*

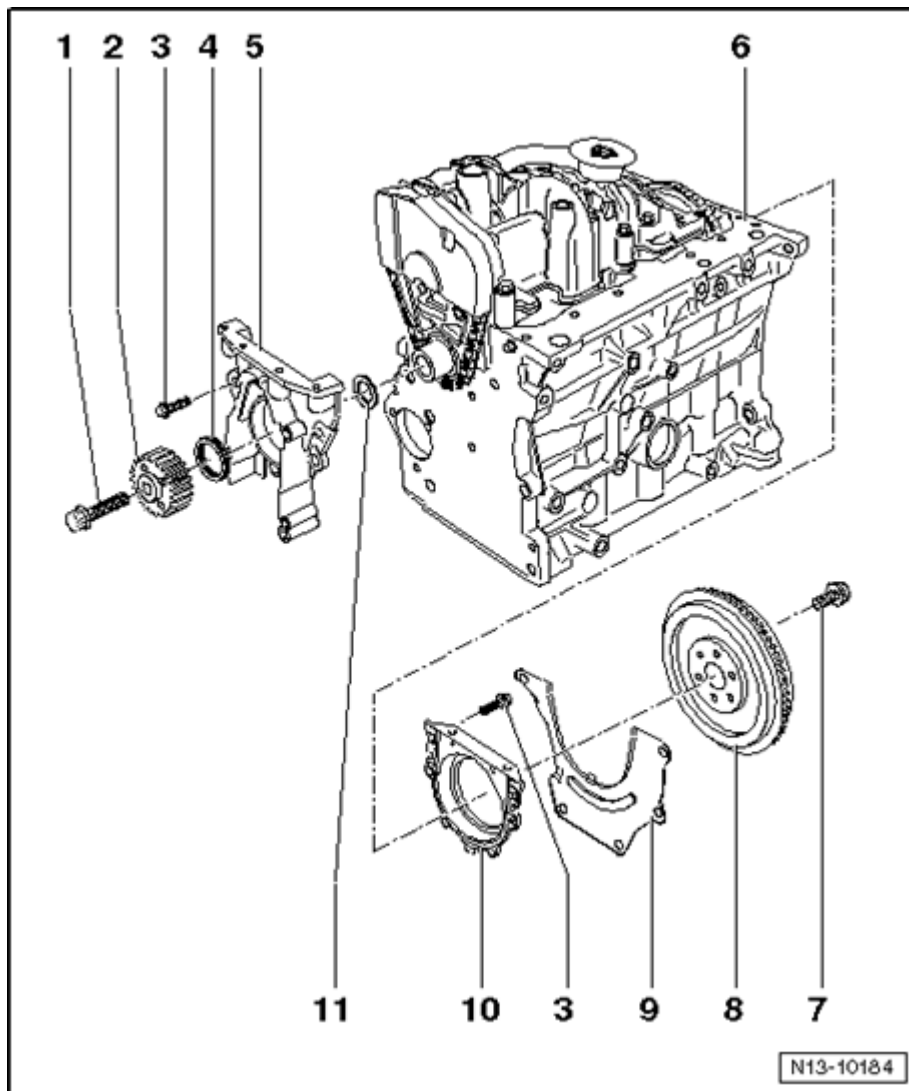
Sealing flange, assembly overview ⇒ [13-2, Sealing flange, assembly overview](#)

Seal for crankshaft - ribbed belt side, replacing ⇒ [13-2, Seal for crankshaft - ribbed belt side, replacing](#)

Sealing flange on belt pulley side, removing and installing ⇒ [13-2, Sealing flange on belt pulley side, removing and installing](#)

Sealing flange for crankshaft on flywheel side, removing and installing ⇒ [13-2, Sealing flange for crankshaft on flywheel side, removing and installing](#)

Sealing flange, assembly overview



- 90 Nm plus an additional $\frac{1}{4}$ turn (90°)
- Toothed belt gear for crankshaft
- 15 Nm
- Seal
 - Do not additionally oil or grease sealing lip of oil seal
 - Replace \Rightarrow [13-2, Seal for crankshaft - ribbed belt side, replacing](#)
- Sealing flange on belt pulley side
 - Must be located on alignment pins

- Removing and installing ⇒ [13-2, Sealing flange on belt pulley side, removing and installing](#)
- To remove and install, remove oil pan

- **Cylinder block**
 - Oil pump with balance shaft drive, removing and installing ⇒ [17-1, Oil pump with balance shaft drive, removing and installing](#)
 - Crankshaft, removing and installing ⇒ [13-3, Crankshaft](#)
 - Pistons and connecting rods, disassembling and assembling ⇒ [13-4, Piston and connecting rod](#)

- **60 Nm plus an additional $1/4$ turn (90°)**
 - Replace

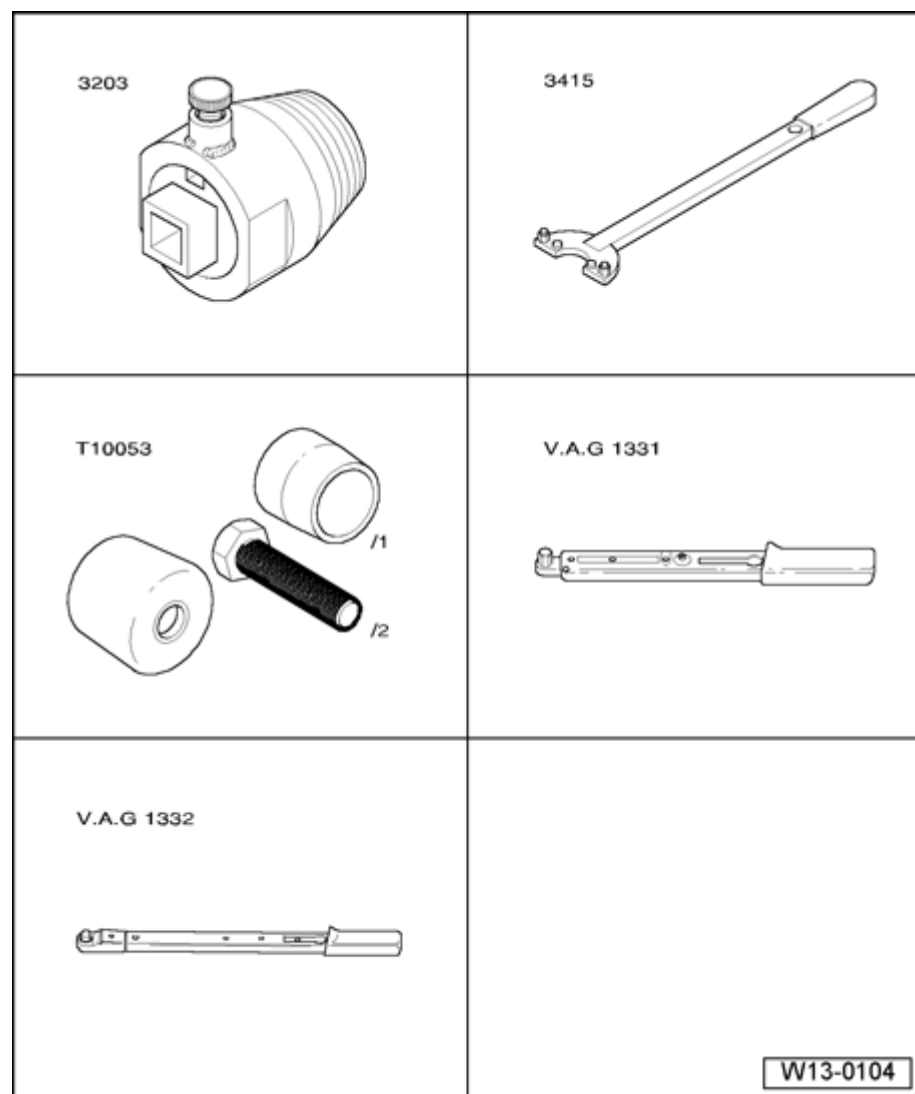
- **Flywheel/drive plate**
 - Removing and installing flywheel
 - Drive plate, removing and installing ⇒ [13-2, Drive plate, removing and installing](#)

- **Intermediate plate**
 - Must be located on dowel sleeves
 - Do not damage or bend while performing repairs

- **Sealing flange with oil seal**

- Replace only as complete unit
 - Removing and installing ⇒ [13-2, Sealing flange for crankshaft on flywheel side, removing and installing](#)
-
- **Diamond disc**
 - Replace

Seal for crankshaft - ribbed belt side, replacing



Special tools, testers and auxiliary items required

- Seal puller 3203

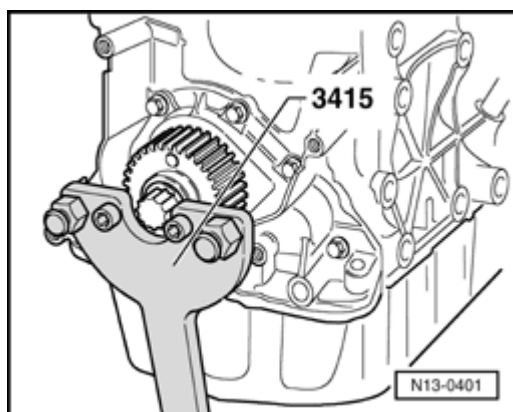
- Retainer 3415
- Assembly tool T10053
- Torque wrench V.A.G 1331
- Torque wrench V.A.G 1332

Removing sealing ring ⇒ [13-2, Removing seal](#)

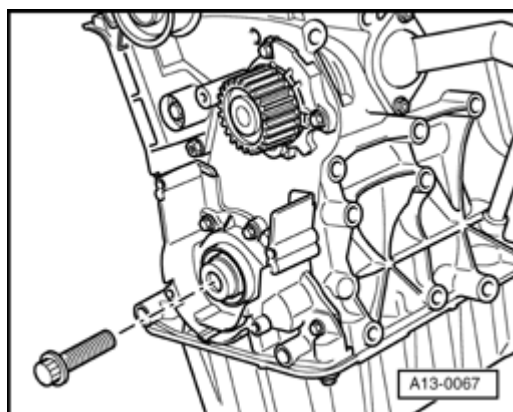
Installing sealing ring ⇒ [13-2, Installing sealing ring](#)

Removing seal

- Remove ribbed belt ⇒ [13-1, Ribbed belt, removing and installing.](#)
- Remove toothed belt ⇒ [15-1, Toothed belt, removing and installing.](#)



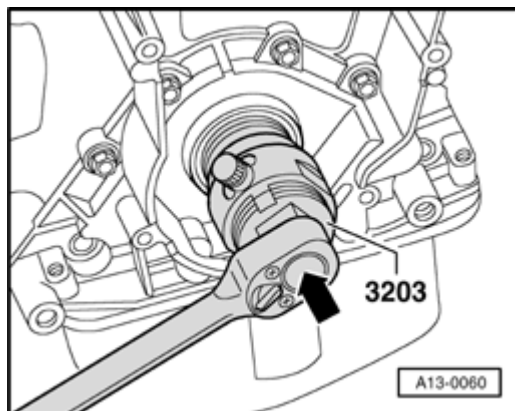
- Remove crankshaft toothed belt gear. Secure toothed belt gear using Counter support 3415.



- To guide seal puller, thread central bolt in crankshaft by

hand until stop.

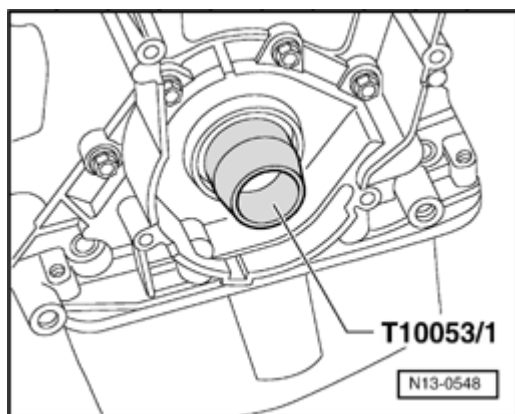
- Unscrew inner portion of seal puller 3203 nine rotations (approx. 20 mm) from outer portion and secure with knurled-head screw.



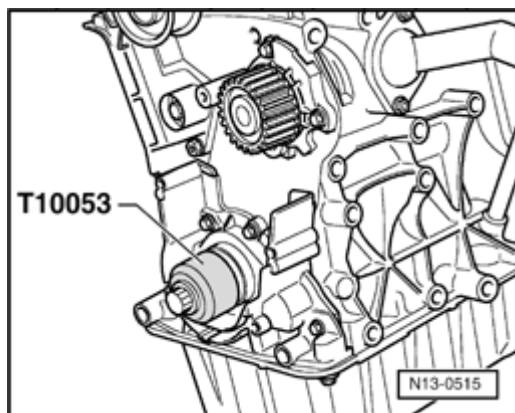
- Grease threaded head of seal puller 3203, position and screw into oil seal as far as possible with forced pressure.
- Loosen knurled bolt and turn inner part against crankshaft until oil seal is removed.

Installing sealing ring

- Remove oil residue at crankshaft pin using a clean rag.



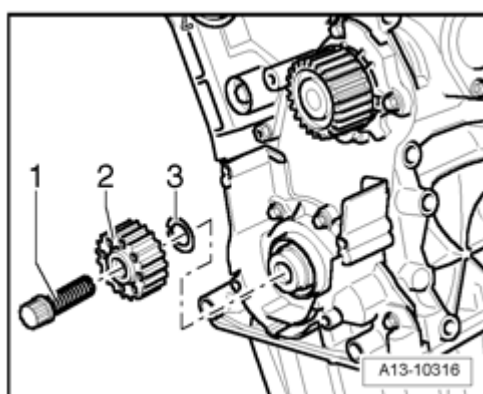
- Position guide sleeve T10053/1 on crankshaft pin.
- Slide dry oil seal over guide sleeve onto crankshaft pin.



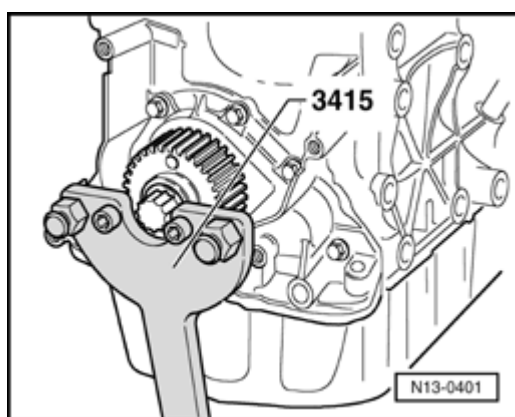
- Press in oil seal using assembly tool T10053 and hex bolt T10053/2 (M16 x 1.5 x 60) up to stop.

Note:

- *Contact surface between toothed belt gear, diamond disc and crankshaft must be free of oil.*
- *Center bolt must be replaced.*
- *Threads and collar must be completely free of oil and grease.*



- Put on toothed belt gear - **2** - with diamond disc - **3** - and tighten bolt - **1** - hand-tight.



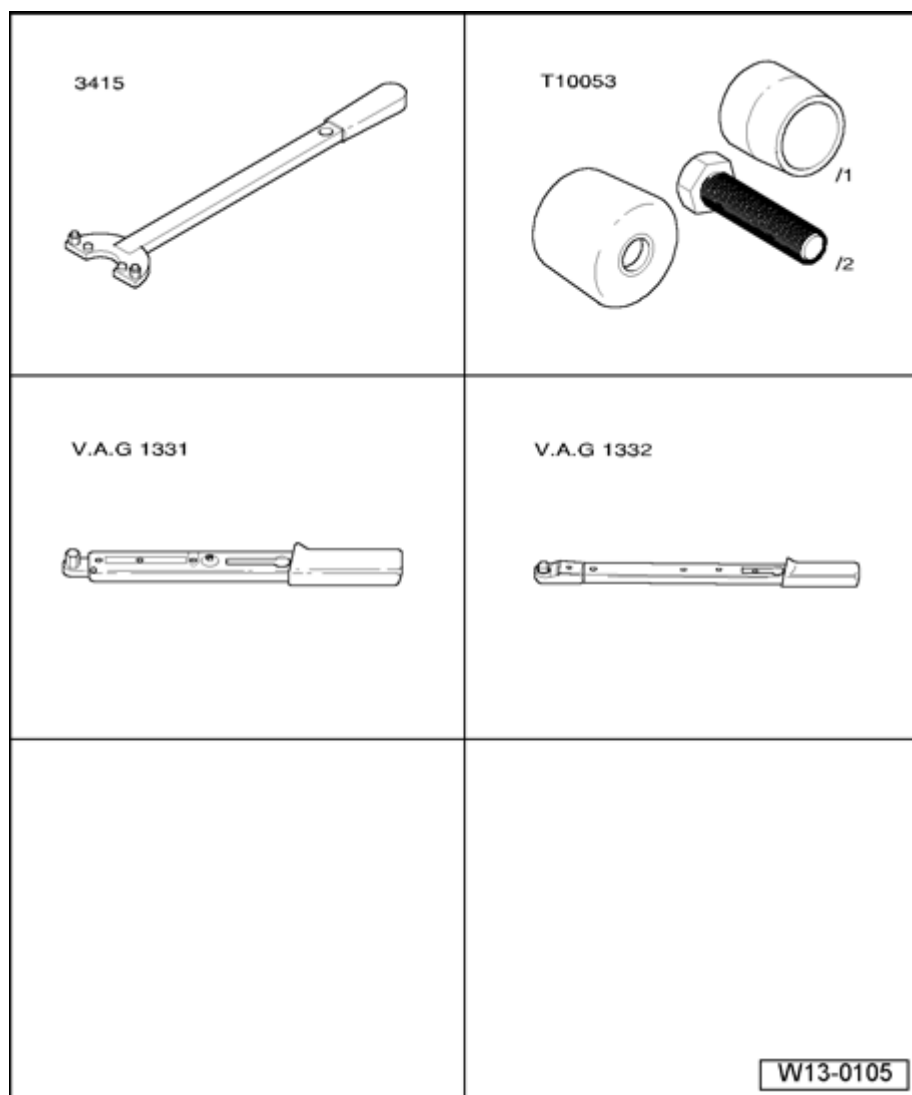
- Secure toothed belt gear using counter-holder tool 3415 .

- Tighten new center bolt to 90 Nm and turn an additional 90 ° (1/4 rotation, additional rotation may occur in several stages).

Installation is in reverse order of removal.

Install toothed belt and adjust valve timing ⇒ [15-1, Toothed belt, removing and installing](#) .

Sealing flange on belt pulley side, removing and installing



Special tools, testers and auxiliary items required

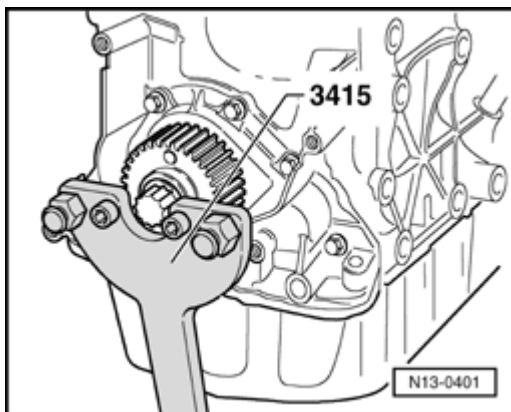
- Counter Support 3415
- Assembly tool T10053
- Torque wrench V.A.G 1331
- Torque wrench V.A.G 1332
- Drill with plastic brush attachment
- Silicon sealant D 176 404 A2
- Scraping tool

Removing sealing flange ⇒ [13-2, Sealing flange, removing](#)

Installing sealing flange ⇒ [13-2, Sealing flange, installing](#)

Sealing flange, removing

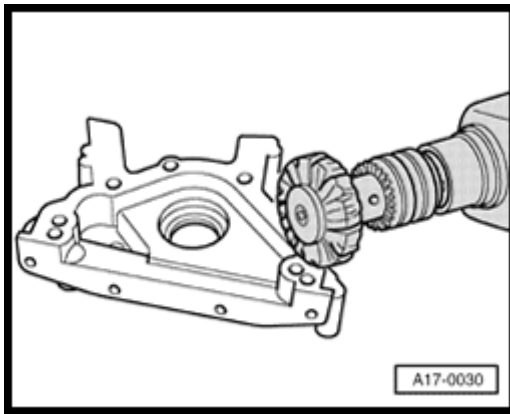
- Remove ribbed belt ⇒ [13-1, Ribbed belt, removing and installing](#) .
- Remove toothed belt ⇒ [15-1, Toothed belt, removing and installing](#) .
- Turn crankshaft back slightly.



- Remove crankshaft toothed belt gear. Secure toothed belt gear using Counter support 3415 .
- Drain engine oil.
- Remove oil pan ⇒ [17-1, Oil pan, removing and installing](#) .
- Remove sealing flange on belt pulley side
- Remove sealing flange, if necessary tap lightly with rubber hammer to remove.
- Remove any remaining sealant from cylinder block using a scraping tool.
- Cover oil seal with a clean rag.

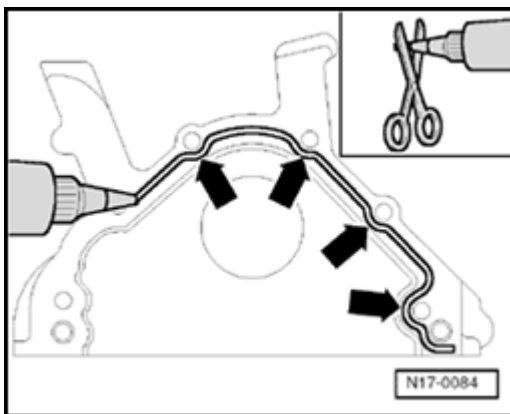
Note:

- *If oil seal is to be replaced, drive out the oil seal.*



- Using rotating plastic brush, remove any remaining sealant from sealing flange (wear protective glasses).
- Clean sealing surface. They must be completely free of oil and grease.

Sealing flange, installing



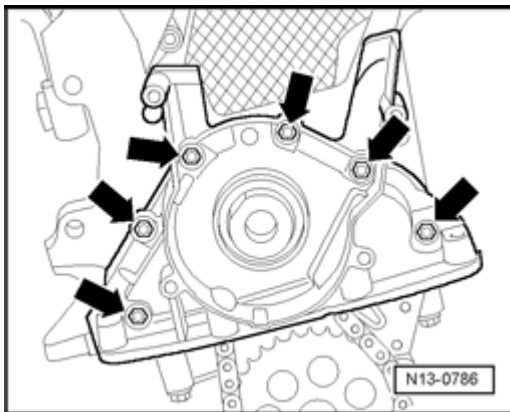
- Cut tube nozzle at front marking (nozzle approx. 3 mm diameter).
- Apply a sealant bead of approx. 2 to 3 mm as shown - **arrows** - on to clean sealing surface of sealing flange.

Note:

- *Cover sealing ring using a clean rag before applying sealant bead.*
- *Sealant bead must not be thicker than 2 to 3 mm, otherwise excess sealant could get into oil pan and clog oil intake pipe strainer.*
- *Note expiration date for sealant.*
- *The sealing flange must be installed within 5 minutes*

after application of silicon sealant.

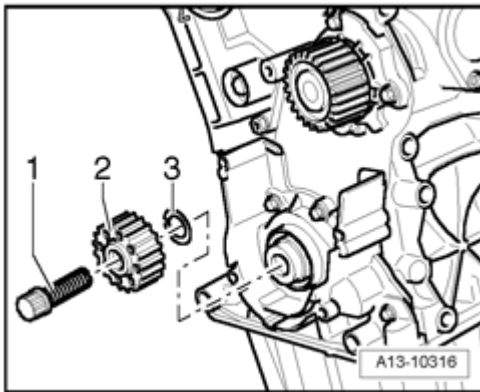
- *To position sealing flange with sealing ring installed, use guide sleeve T10053/1 .*
- *After installing, allow sealant to dry for approx. 30 minutes. Allow sealant to dry before adding engine oil.*



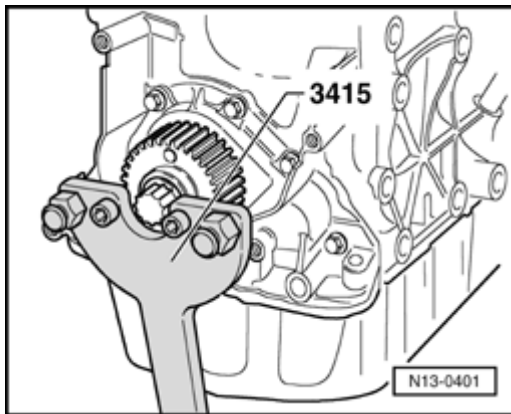
- Position sealing flange immediately and lightly tighten all bolts - **arrows** - .
- Tighten mounting bolts of sealing flange diagonally.
Tightening torque: 15 Nm
- Remove excessive sealant.
- Install oil pan ⇒ [17-1, Oil pan, removing and installing](#) .
- Install sealing ring if necessary ⇒ [13-2, Installing sealing ring](#) .

Note:

- *Contact surface between toothed belt gear, diamond disc and crankshaft must be free of oil.*
- *Center bolt must be replaced.*
- *Threads and collar must be completely free of oil and grease.*



- Put on toothed belt gear - 2 - with diamond disc - 3 - and tighten bolt - 1 - hand-tight.



- Secure toothed belt gear using counter-holder tool 3415 .
- Tighten new center bolt to 90 Nm and turn an additional 90 ° (1/4 rotation, additional rotation may occur in several stages).

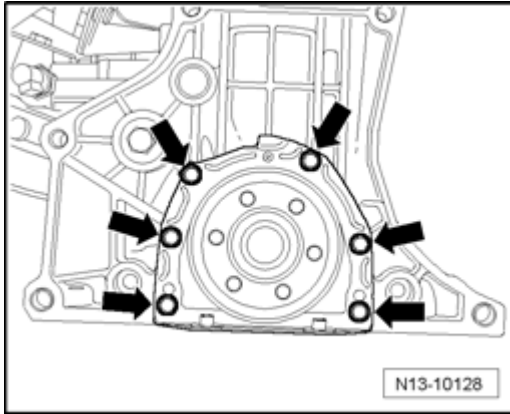
Installation is in reverse order of removal.

Install toothed belt and adjust valve timing ⇒ [15-1, Toothed belt, removing and installing](#) .

Sealing flange for crankshaft on flywheel side, removing and installing

Sealing flange, removing

- Remove transmission.
- Remove flywheel.
- Remove oil pan ⇒ [17-1, Oil pan, removing and installing](#) .



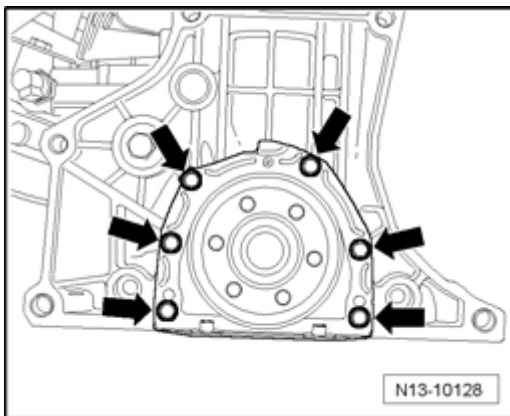
- Unbolt sealing flange - **arrows** - .

Sealing flange, installing

Note:

- *Do not add oil or grease sealing lip of oil seal!*

- Clean sealing surface. They must be completely free of oil and grease.
- Remove oil residue at crankshaft pin using a clean rag.
- To install, use support sleeve provided. Supporting sleeve may only be removed after sealing flange has been slid onto crankshaft pin. Sealing flange is located on alignment pins.

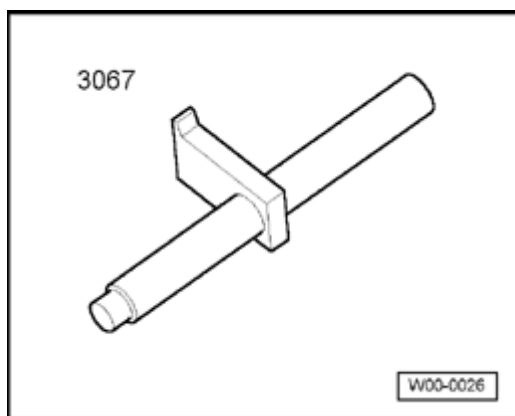


- Tighten mounting bolts - **arrows** - to 15 Nm.
- Install oil pan ⇒ [17-1, Oil pan, removing and installing](#) .

Installation is in reverse order of removal.

Flywheel, removing and installing

Special tools, testers and auxiliary items required

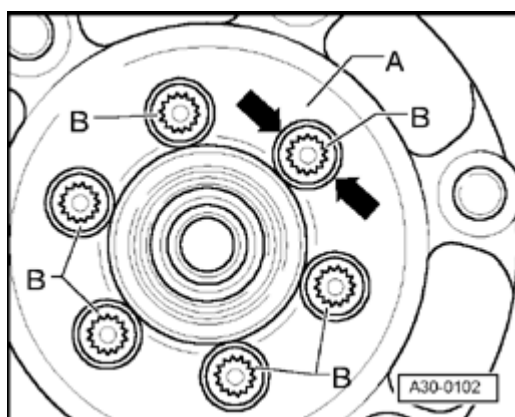


- Flywheel Retainer 3067

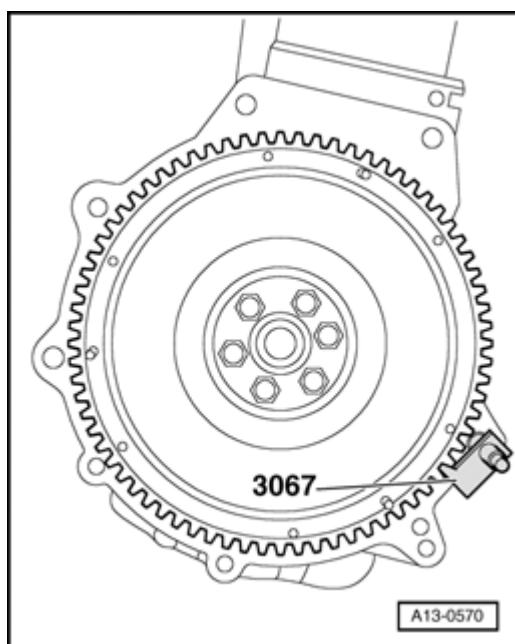
Removing

Note:

- *To prevent damage to dual-mass flywheel when removing, bolts - **B** - must not be unscrewed using an air-powered or impact wrench. Only removing bolts - **B** - by hand is permitted.*



- Rotate dual-mass flywheel - **A** - so that bolts - **B** - stand centered to holes - **arrows** - .
- When removing bolts - **B** - , make sure that bolt head is not jammed in flywheel.



- Insert Flywheel Retainer 3067 in hole on cylinder block.
- Mark flywheel to engine.
- Remove flywheel.

Installing

Installation is in reverse order of removal, note the following:

- Replace bolts.

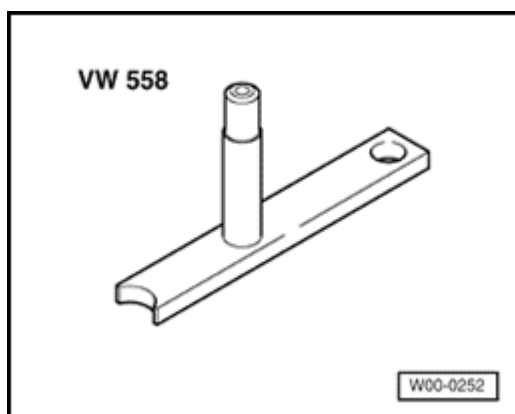
Tightening torque

Component	Nm
Dual-mass flywheel to crankshaft	60 plus an additional 90 ° 1)

1) 90 ° corresponds to one quarter turn

Drive plate, removing and installing

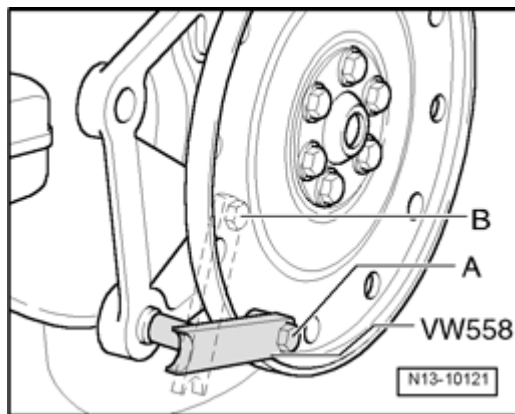
Special tools, testers and auxiliary items required



- Retainer VW 558
- Depth gauge
- Hex bolt M8x45 and two M10 hex nuts

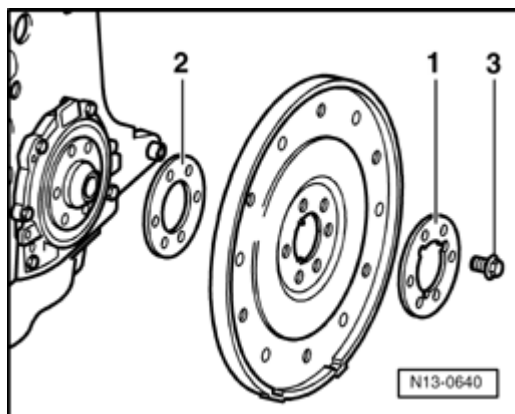
Loosening and tightening drive plate:

- Secure flywheel lock adapter VW 558 with hex bolt M8x45 to drive plate. Insert two M10 hex nuts between flywheel lock adapter and drive plate.

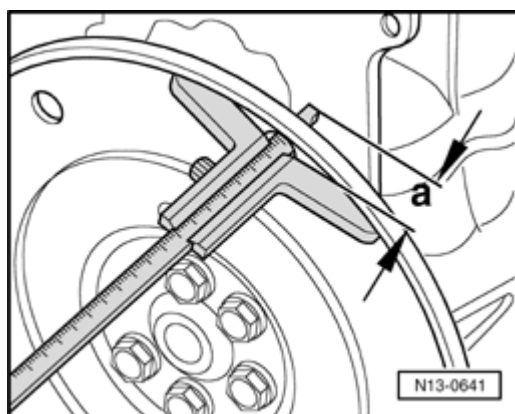


Installation position of flywheel lock adapter. - **A** - to loosen, - **B** - to tighten.

Installing drive plate:



- Position drive plate using grooved washer - **1** - .
- Insert new bolts - **3** - and tighten to 30 Nm.
- Check dimension - **a** - an three points and calculate mean value.

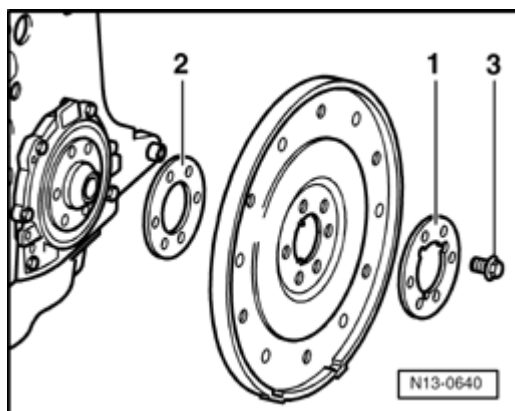


Specified value: 19.5 to 21.1 mm

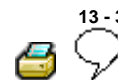
Note:

- *Measure through drive plate hole to milled surface of cylinder block.*

If specified value is not reached:



- Remove drive plate again and use shim - **2** - . Tighten bolts - **3** - to 30 Nm again.
- Tighten bolts to 60 Nm and turn an additional 90 ° (1/4 rotation, additional rotation may occur in several stages).



Crankshaft

Note:

- *Before removing crankshaft, prepare for appropriate storage, so that sensor wheel ⇒ [Item - 4 -](#) does not make contact or become damaged.*
- *Engine is to be secured to engine and transmission holder VAS 6095 for performing assembly work.*

Crankshaft, assembly overview ⇒ [13-3, Crankshaft, assembly overview](#)

Sensor wheel, removing and installing ⇒ [13-3, Sensor gear, removing and installing](#)

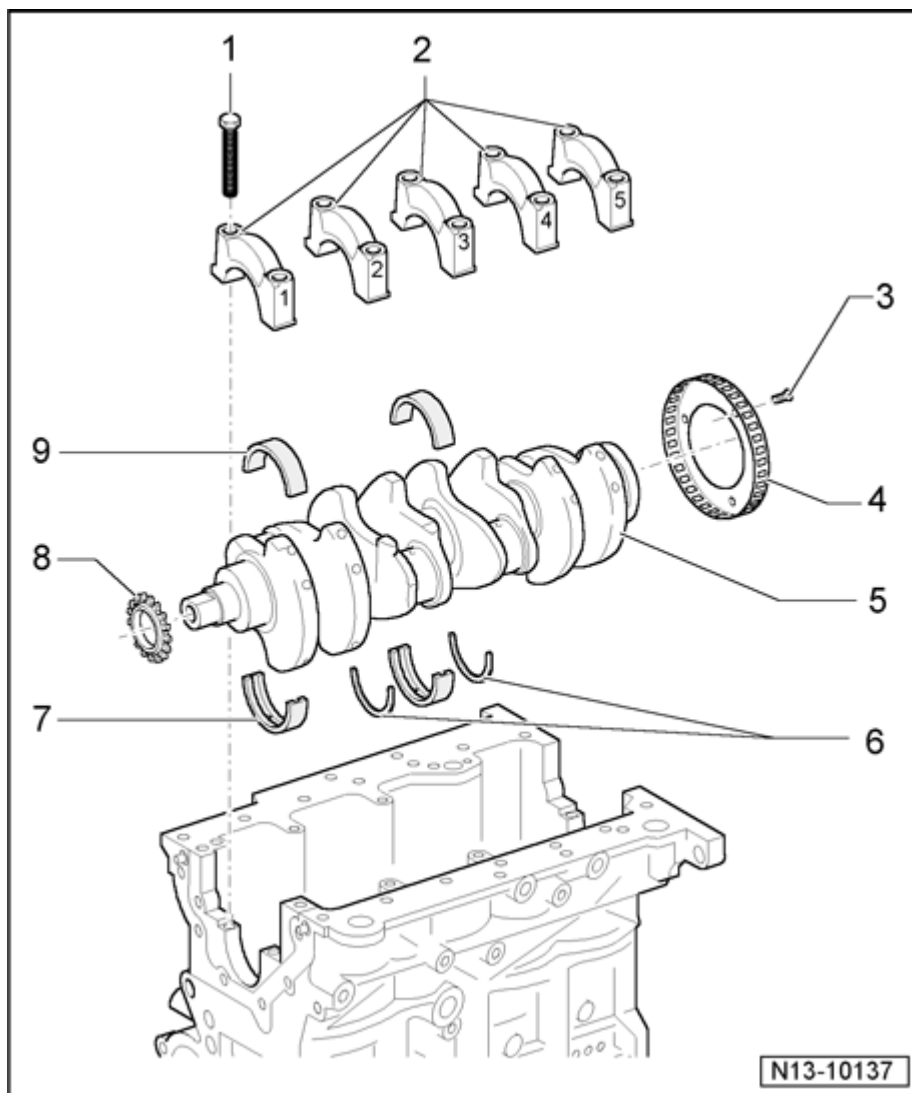
Crankshaft measurements ⇒ [13-3, Crankshaft measurements](#)

Identification on crankshaft bearing, top ⇒ [13-3, Identification on crankshaft bearing, top](#)

Crankshaft, assembly overview

Note :

- *In vehicles with Direct Shift Transmission, a needle bearing must be installed at rear in crankshaft.*



- **65 Nm plus an additional 90 °**
($\frac{1}{4}$ turn)
 - Replace
 - Continuous thread
 - For measuring radial play of crankshaft, tighten to 65 Nm only. Do not rotate further.

- **Bearing caps**
 - Bearing cap 1: Belt pulley side
 - Retaining tabs for cylinder block bearing shells/bearing caps must align

- **10 Nm plus an additional 90°**
($\frac{1}{4}$ turn)
 - Replace

- **Sensor wheel**
 - For Engine Speed (RPM)
Sensor G28
 - Every time bolts are removed, replace sensor gear.
 - Installation is only possible in one position (bore holes offset)
 - Removing and installing ⇒ [13-3, Sensor gear, removing and installing](#)

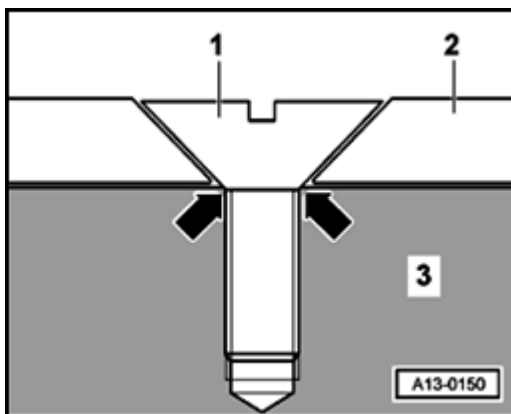
- **Crankshaft**
 - Axial play when new: 0.07 to 0.23 mm wear limit: 0.30 mm
 - Measure radial play with Plastigage again: 0.017 to 0.037 mm wear limit: 0.07 mm
 - Do not turn crankshaft when measuring radial play.
 - Crankshaft measurements ⇒ [13-3, Crankshaft measurements](#)
 - Removing and installing needle bearing ⇒ [13-3, Pulling out needle bearings from crankshaft and driving in](#)

- **Thrust plates**
 - For bearing 3

- **Bearing shell for cylinder block**

- With lubricating groove
 - Classification for replacement part ordering ⇒
[13-3, Identification on crankshaft bearing, top](#)
 - Do not interchange run-in connecting rod bearing shells (mark)
-
- **Chain sprocket**
 - For operating oil pump
-
- **Bearing shell for bearing cap**
 - Without lubricating groove
 - Do not interchange run-in connecting rod bearing shells (mark)

Sensor gear, removing and installing



- Always replace sensor wheel - **2** - whenever bolts are removed - **1** - .

Note:

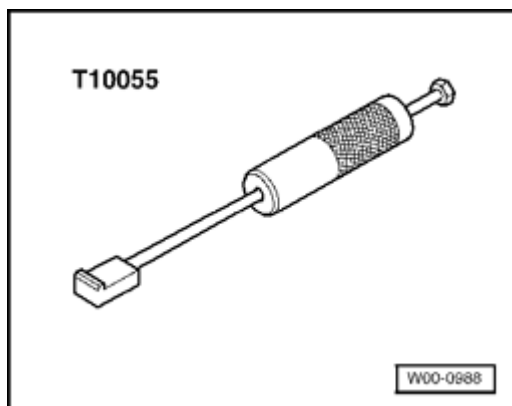
- *After tightening a second time, the attachment point of the countersunk screws of the sensor wheel are so deformed that the screw heads lie on the crankshaft - **3** - - **arrows** - and the sensor wheel is loose underneath the screws.*
- *Installation of the sensor wheel is only possible in*

one position, the bore holes are shifted.

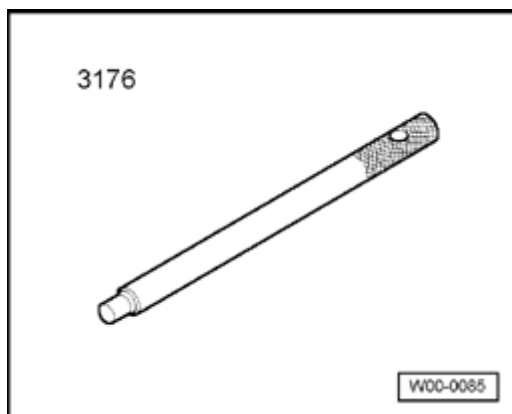
Pulling out needle bearings from crankshaft and driving in

Only for vehicles with Direct Shift Transmission

Special tools, testers and auxiliary items required

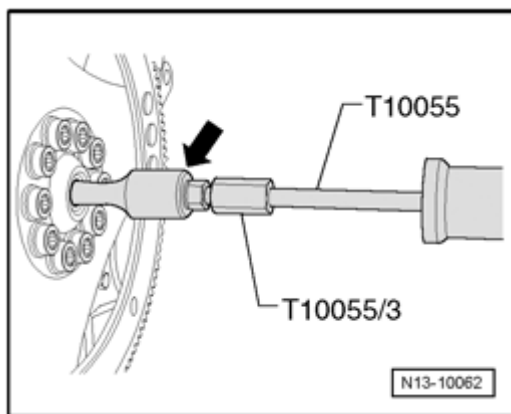


- Puller T10055
- With adapter T10055/3



- Centering mandrel 3176
- or drift VW 207 C
- Extractor e.g. Kukko 21/2

Removing

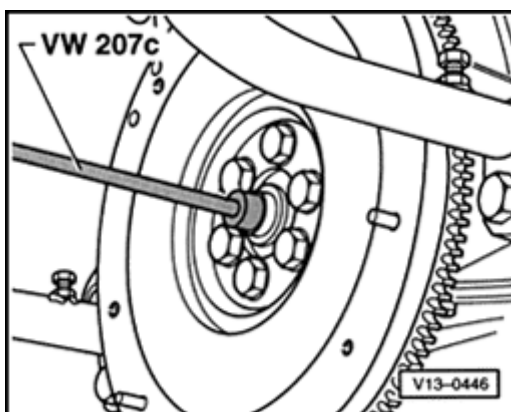


- Pull out using standard extractor e.g. Kukko 21/2 - **arrow** - , adapter T10055/3 and puller T10055 .

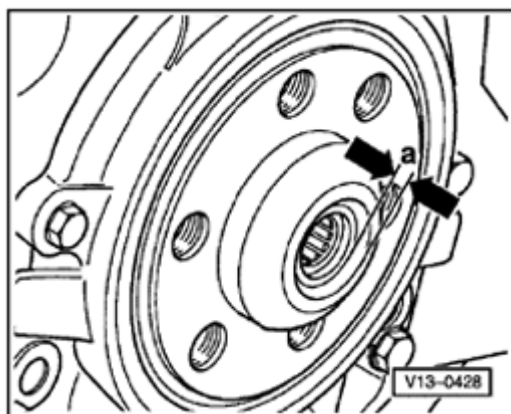
Installing

Note:

- Side of needle bearing with writing on it must be readable when installed.



- Drive in using drift VW 207 C or centering mandrel 3176 .



Installation depth dimension - **a** - = 2 mm

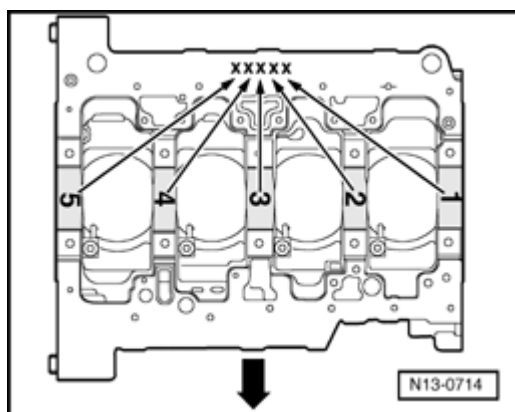
Crankshaft measurements

(Distance in mm)

Grind distance	Crankshaft bearing pins-diameter		Connecting rod bearing pins-diameter	
Basic dimension	54.00	-0.017 -0.037	47.80	-0.022 -0.042
Stage I	53.75	-0.017 -0.037	47.55	-0.022 -0.042
Stage II	53.50	-0.017 -0.037	47.30	-0.022 -0.042
Stage III	53.25	-0.017 -0.037	47.05	-0.022 -0.042

Identification on crankshaft bearing, top

In the factory, the upper bearing shells are assigned to the cylinder block with the correct thickness. Colored dots serve for identifying bearing shell thickness.



The letters marked on the lower sealing surface of the cylinder block identify which bearing thickness must be installed in which location.

G	=	yellow
B	=	blue
W	=	white

Note:

- - **Arrow** - points in direction of travel.
- If color markings can no longer be read, use the blue bearing shell.

- *The lower crankshaft bearing shells are always shipped as replacement part with "yellow" color marking.*



Piston and connecting rod

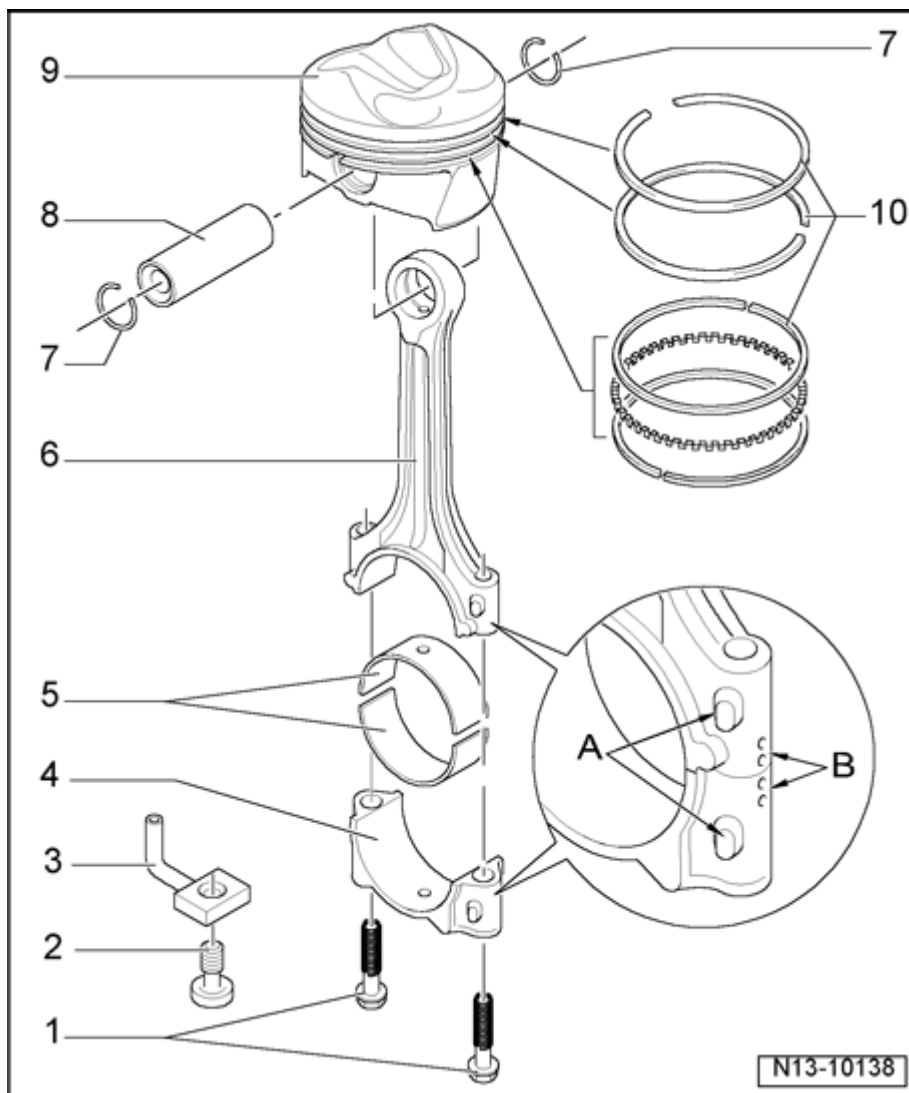
Pistons and connecting rods, assembly overview ⇒ [13-4, Pistons and connecting rods, assembly overview](#)

Bearing shells - installation position ⇒ [13-4, Bearing shells, installation position](#)

Checking pistons, piston rings and cylinder bore ⇒ [13-4, Pistons, piston rings and cylinder bore, checking](#)

Piston and cylinder dimensions ⇒ [13-4, Piston and cylinder measurements](#)

Pistons and connecting rods, assembly overview



- **Connecting rod bolt 30 Nm plus an additional 90 ° (1/4 turn)**
 - Replace

- Grease thread and contact surface
- When measuring radial clearance, tighten to 30 Nm (15 ft lb) but do not turn further

- **Pressure release valve, 27 Nm**
 - Opening pressure: 1.3 to 1.6 bar positive pressure

- **Oil injection jet**
 - To cool pistons

- **Connecting rod bearing cap**
 - Note installed position
 - Connecting rods were separated by cracking, therefore the cover fits in only one position and only to the corresponding connecting rod.
 - Mark matching cylinder - **B** -
 - Installation position:
Markings - **A** - point to belt pulley side

- **Bearing shell**
 - Note installed position ⇒ [13-4, Bearing shells, installation position](#)
 - Do not interchange used bearing shells
 - Axial play when new: 0.10 to 0.35 mm wear limit: 0.4 mm
 - Measure radial play with Plastigage: New: 0.02 to 0.06 mm wear limit: 0.09 mm
Do not turn crankshaft when measuring radial play.

- **Connecting rod**

- With cracked bearing cap
- Replace only as a set
- Mark matching cylinder - **B** -
- Installation position:
Markings - **A** - point to belt pulley side

- **Securing ring**

- **Piston pins**

- In case of difficulty of movement, warm piston to 60 ° C.
- removing and installing using a drift VW 222 A

- **Pistons**

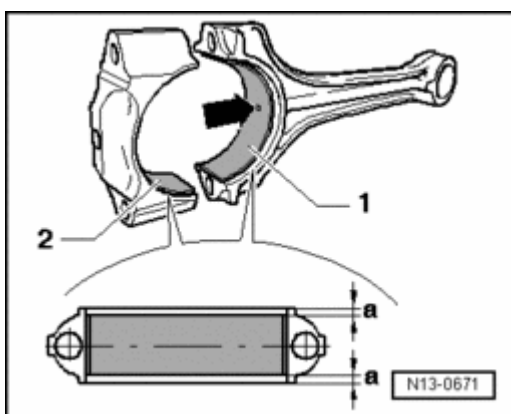
- Checking ⇒ [13-4, Checking pistons](#)
- Mark installation position and matching cylinder
- Arrow on piston head points to belt pulley side
- Install with piston ring tension strip
- Checking cylinder bore ⇒ [13-4, Check bore](#)
- Piston and cylinder dimensions ⇒ [13-4, Piston and cylinder measurements](#)

- **Piston rings**

- Shift by 120 °
- Use piston ring pliers to remove and install
- Markings face piston head

- Check end play ⇒ [13-4, Checking piston ring end gap](#)
- Checking height play ⇒ [13-4, Checking piston ring side clearance](#)

Bearing shells, installation position



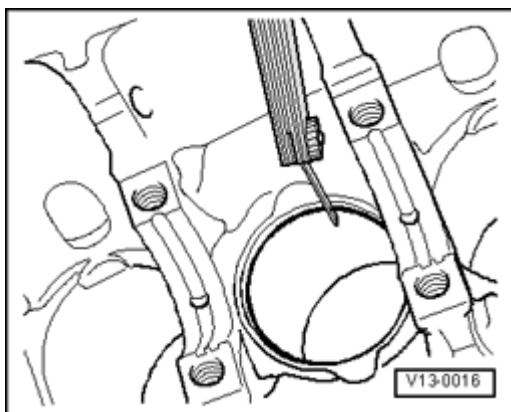
Bearing shell - **1** - with oil bore - **arrow** - for connecting rod.

Bearing shell - **2** - without oil bore for connecting rod bearing cap.

- Insert bearing shells into connecting rod and connecting rod bearing cap in centered manner.

Dimension - **a** - must be the same at left and right.

Pistons, piston rings and cylinder bore, checking



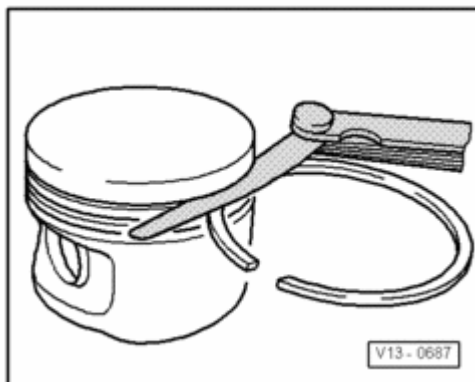
Checking piston ring end gap

Special tools, testers and auxiliary items required

- Feeler gauge

- Insert ring into lower cylinder opening at a right angle from above, approx. 15 mm from cylinder edge.

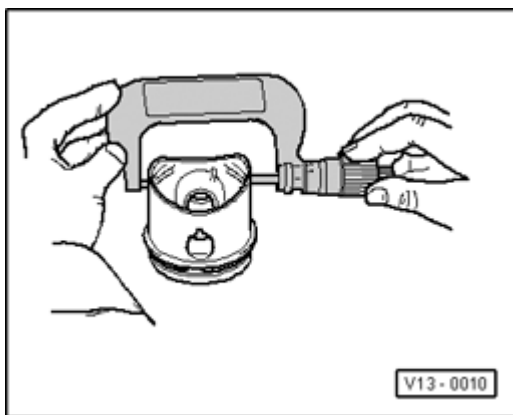
Piston ring		End play	
		New	Wear limit
Compression rings	mm	0.20 to 0.40	0.8
Oil scraper ring	mm	0.25 to 0.50	0.8

**Checking piston ring side clearance****Special tools, testers and auxiliary items required**

- Feeler gauge

- Before measuring, clean ring groove.

Piston ring		Side 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



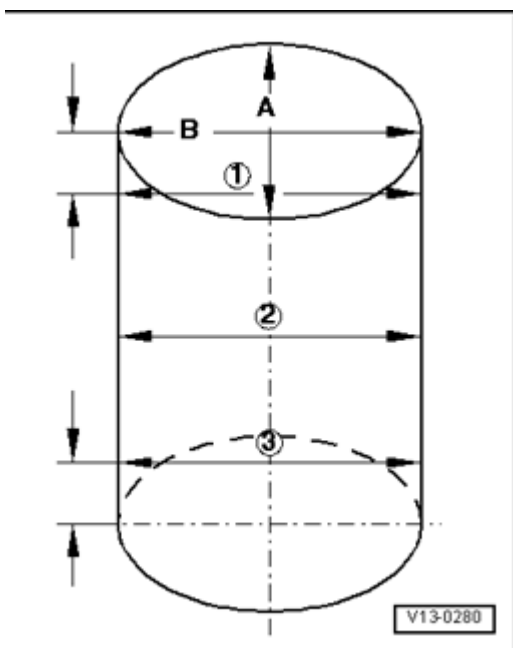
Checking pistons

Special tools, testers and auxiliary items required

- External micrometer 75-100 mm

- Measure pistons approx. 10 mm (3/8 in.) from bottom edge at points offset by 90° to piston pin axis.

Deviation from specified size: max. 0.04 mm



Check bore

Special tools, testers and auxiliary items required

- Internal dial gauge 50 to 100 mm

- Measure diagonally at 3 positions transversely - **A** - and longitudinally - **B** - .

Deviation from nominal size: max. 0.08 mm.

Note:

- *Cylinder bore measurement must not be performed if cylinder block is secured to assembly stand with holding fixture VAS 6095 , since inaccurate measurements are possible.*

Piston and cylinder measurements

Grind distance		Piston-dia.	Cylinder bore-dia.
Basic dimension	mm	82.465 ¹⁾	82.51

¹⁾ Dimensions exclude graphite coating (thickness 0.02 mm). The graphite coating wears off.