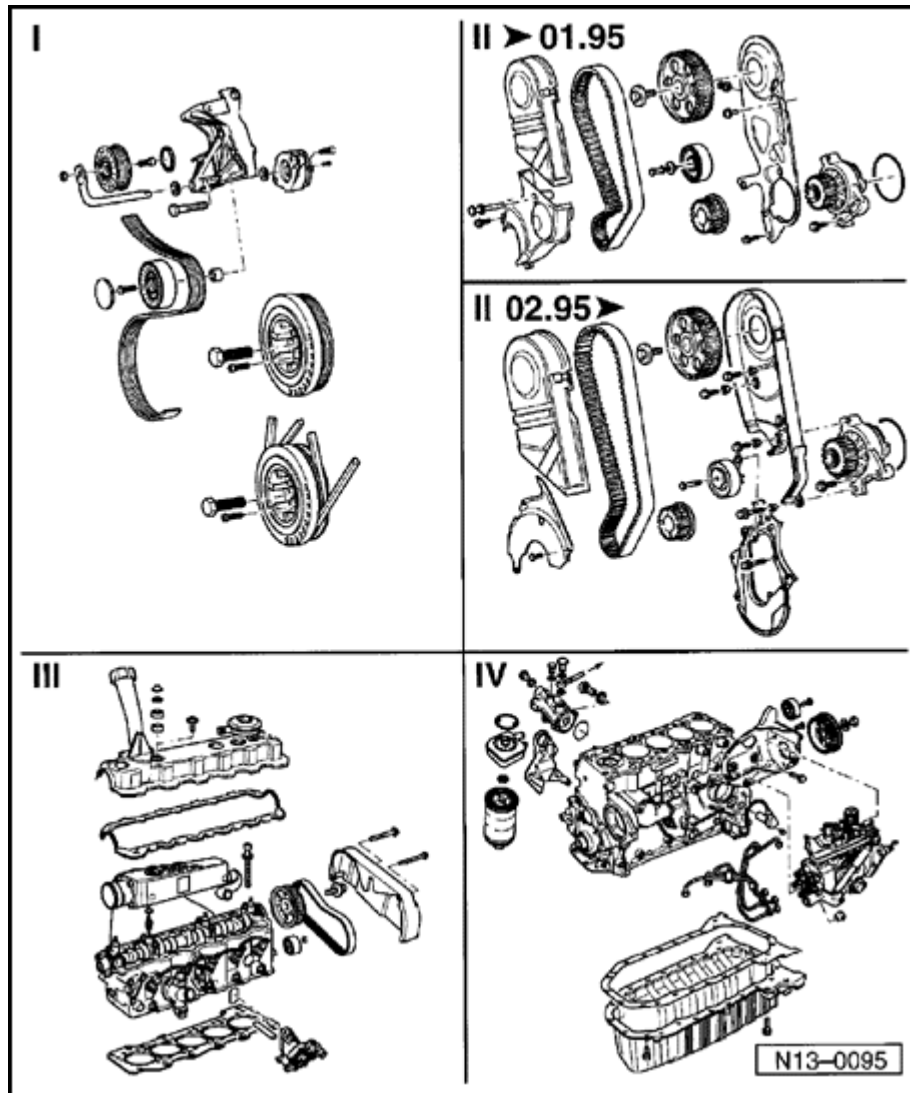


## Engine, disassembling and assembling

### Note:

- ◆ Replace the oil cooler and thoroughly clean the oil passages if you find metal shavings or larger quantities of small metal particles in the engine oil, caused, for example, by partial seizure of the crankshaft and connecting rod bearings.
- ◆ Faulty injectors can cause violent knocking noises in the engine which sound like faulty bearings. When this occurs, run engine at idling speed and loosen injector line unions one after the other. If knocking stops when a union is loosened, this indicates that the injector concerned is faulty.



Servicing injectors:

Engine code AAB

⇒ [Repair Manual , 2.4 Liter 5-Cyl. 2V Diesel Fuel Injection & Glow Plug, Engine Code\(s\): AAB, Repair Group 23; Servicing fuel injection system; Servicing injectors](#)

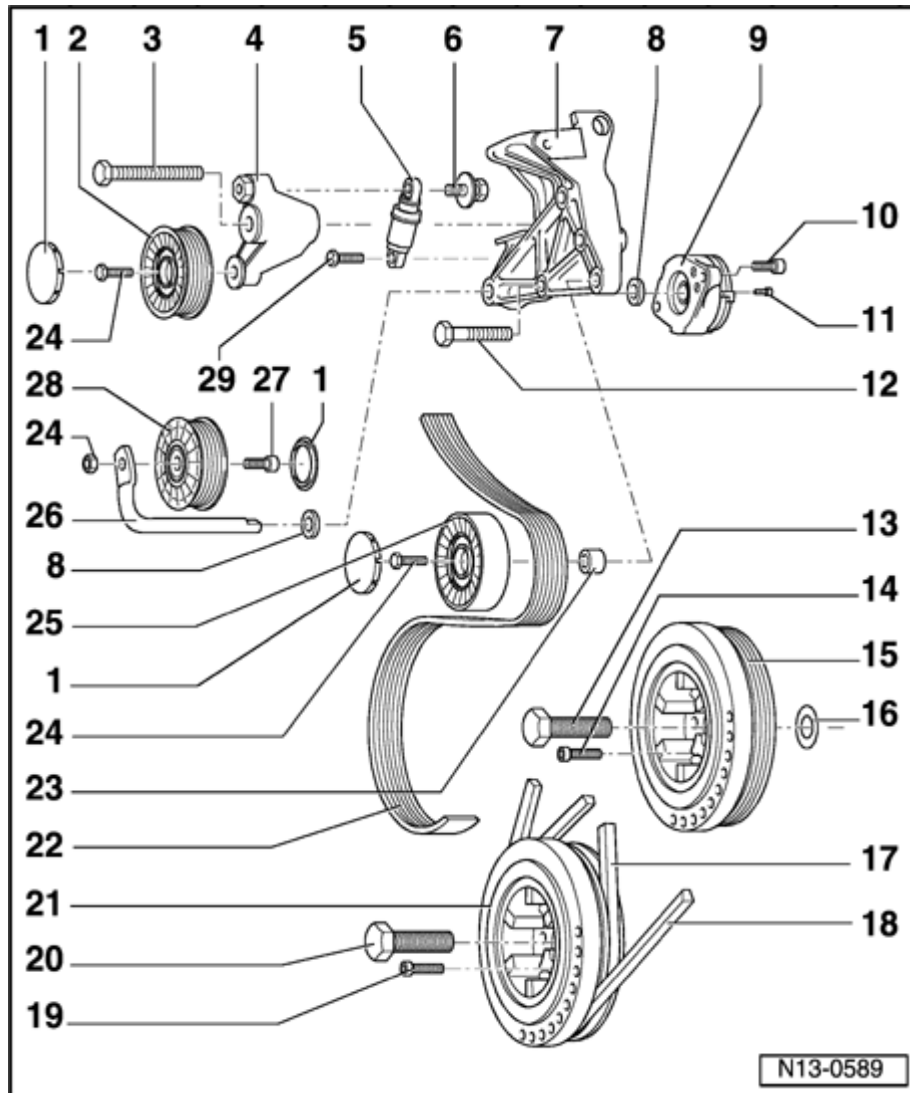
I ⇒ [Page 13-3](#)

II > 01.95 ⇒ [Page 13-8](#)

II 02.95 > ⇒ [Page 13-11](#)

III ⇒ [Page 13-14](#)

IV ⇒ [Page 13-19](#)



### Part I

1 - Dust cap

2 - Tensioner

3 - 40 Nm

4 - Bracket

5 - Tensioning element for tensioning roller

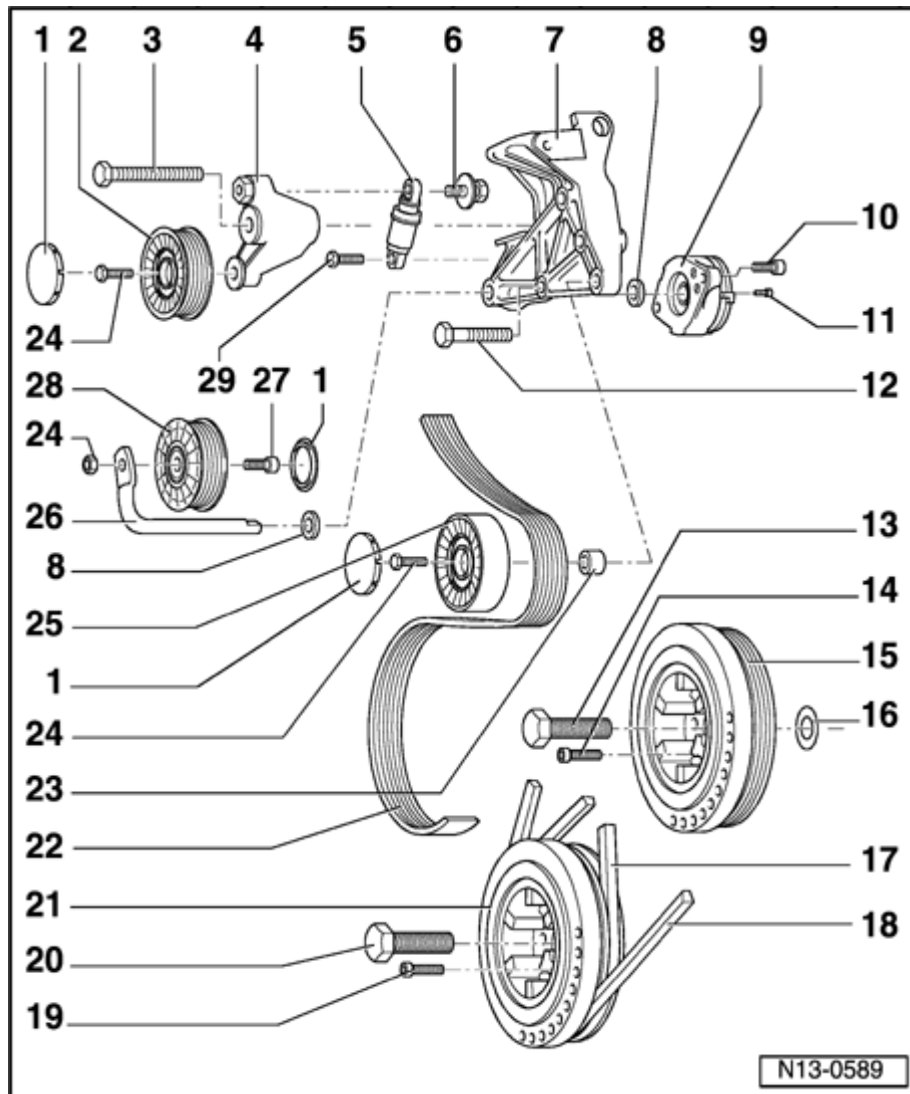
◆ To remove, the vibration damper must be removed first

6 - 20 Nm

7 - Bracket

8 - Seal

◆ Always replace



### 9 - Tensioning element for tensioning roller

- ◆ 02.95 ➤
- ◆ Engine code AAB, ACV
- ◆ Can only be installed in one position. Holes are off-set
- ◆ Removing and installing ribbed belt tensioning device ⇒ [Page 13-30](#)

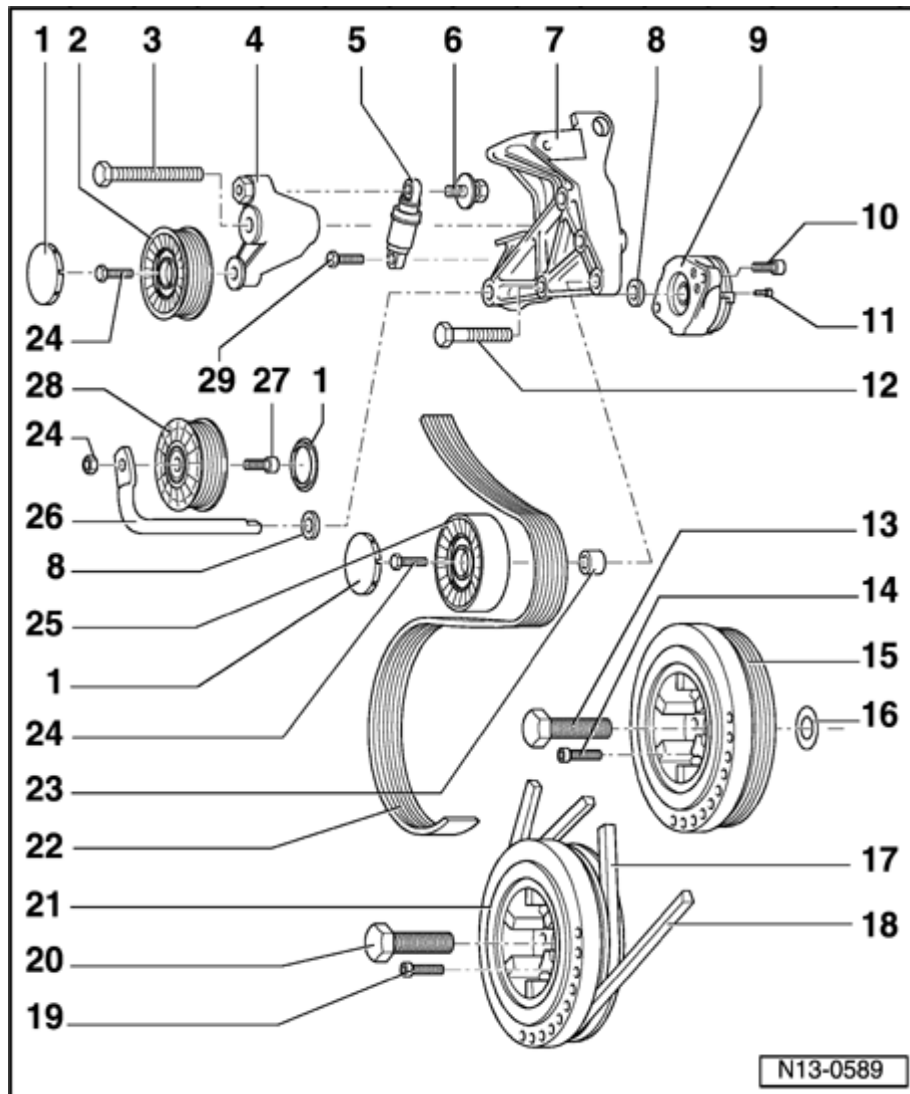
10 - 20 Nm

11 - 10 Nm

12 - 40 Nm

13 - 160 Nm plus addition 180 ° turn

- ◆ 02.95 ➤
- ◆ Replace
- ◆ Threads and shoulder must be free of oil and grease
- ◆ Counter-hold with T10025 to loosen and tighten
- ◆ Removing, installing and tensioning camshaft toothed belt ⇒ [Page 13-45](#)



14 - 20 Nm plus additional 90 ° turn

◆ 02.95 ➤

15 - Vibration damper with ribbed belt pulley

◆ 02.95 ➤

◆ When installing note fixing arrangement

16 - Washer

◆ Always replace

◆ Diamond coated

17 - V-belt

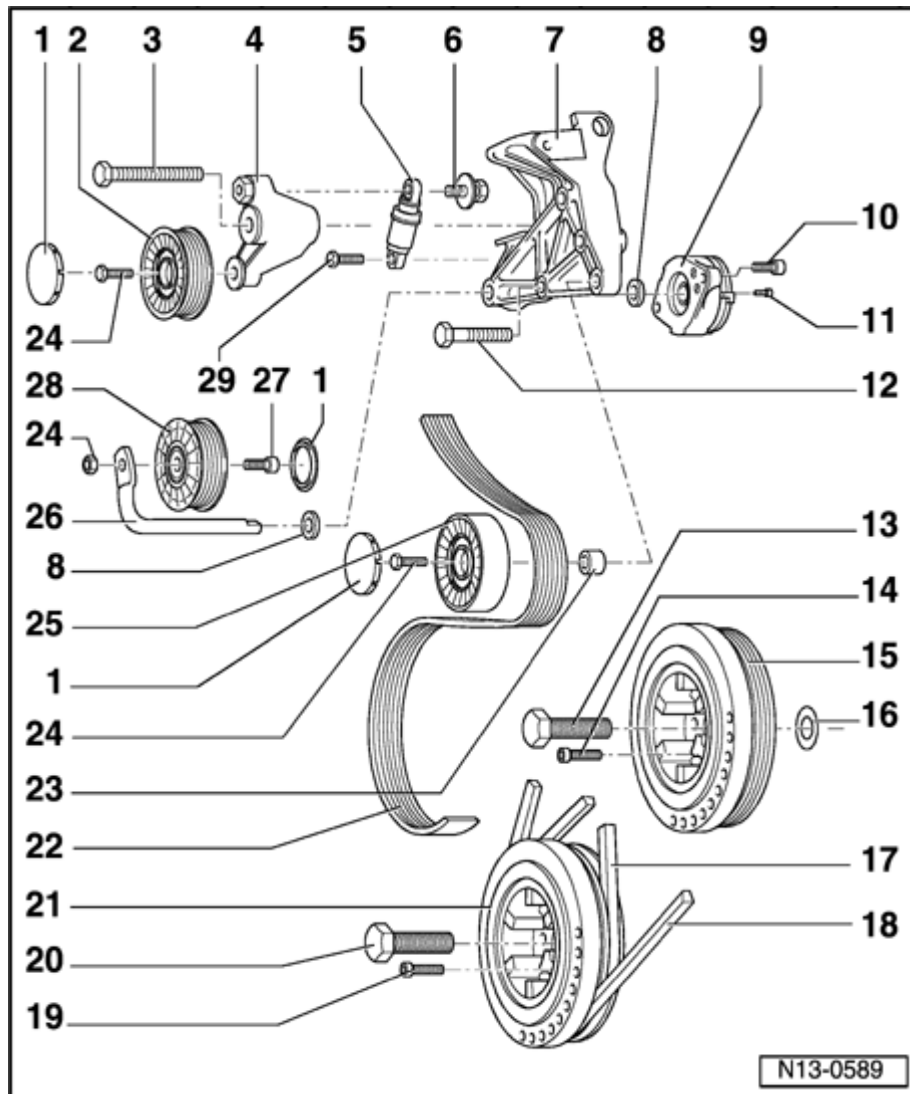
◆ For power steering vane pump

◆ ➤01.95

◆ Check tension by thumb pressure  
Deflection: Approx. 5 mm (new and used V-belts)

◆ Adjust V-belt tension

⇒ [Repair Manual , Suspension, Wheels, Brakes, Steering m.y. 1992-1996, Repair Group 48; Assembly overview: vane pump, reservoir, hydraulic lines](#)



### 18 - V-belt

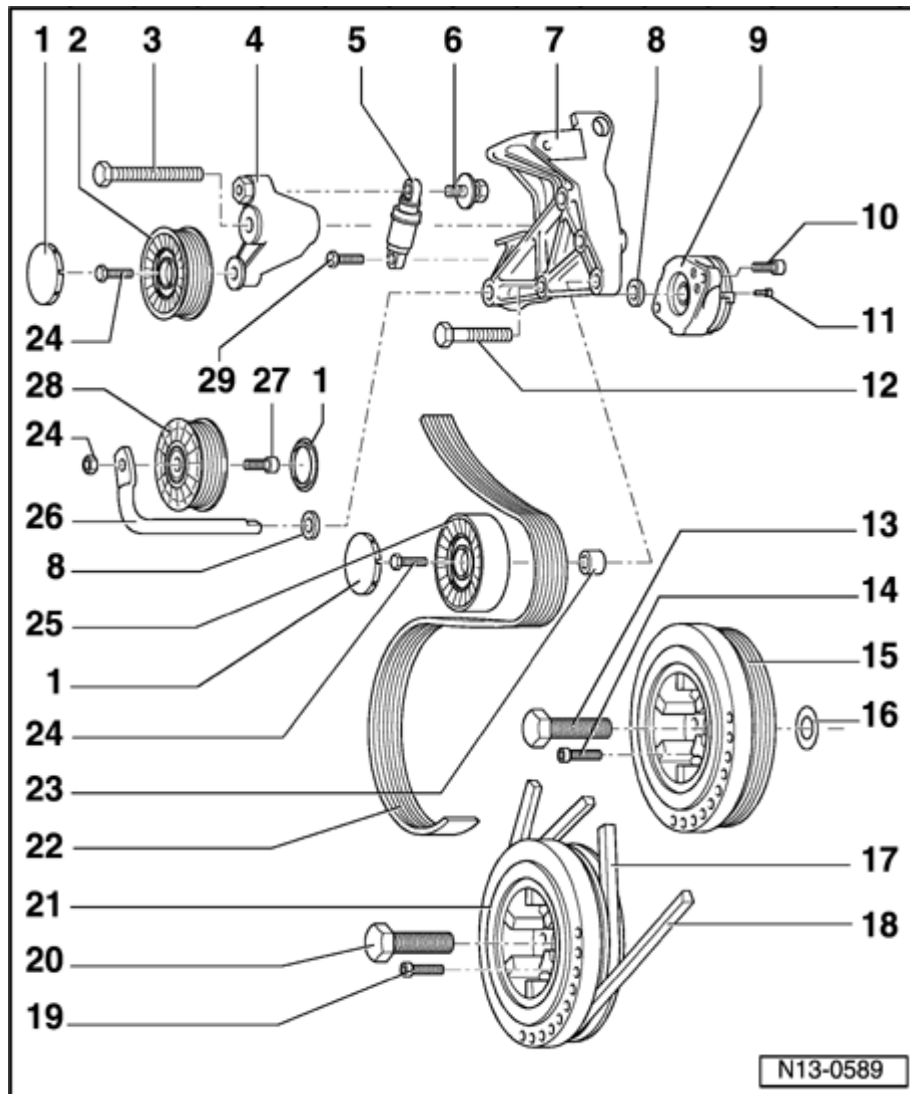
- ◆ For generator
- ◆ ➤01.95
- ◆ Check tension by thumb pressure max. deflection:  
New ribbed belt approx. 2 mm,  
Used ribbed belt approx. 5 mm
- ◆ Checking V-belt tension on vehicles with toothed rack tensioner ⇒ [Page 13-25](#)

### 19 - 20 Nm

- ◆ ➤01.95

### 20 - 460 Nm

- ◆ ➤01.95
- ◆ Coat threads and bolt head contact surface with sealing paste AMV 188 001 02
- ◆ Counter-hold with T10025 to loosen and tighten
- ◆ Removing, installing and tensioning camshaft toothed belt ⇒ [Page 13-34](#)



### 21 - Vibration damper with V-belt pulley

- ◆ ➤ 01.95
- ◆ When installing note fixing arrangement

### 22 - Ribbed belt

- ◆ 02.95 ➤
- ◆ Mark direction of rotation before removing
- ◆ Check for wear
- ◆ Removing and installing ⇒ [Page 13-27](#)

### 23 - Spacer bushing

### 24 - 20 Nm

### 25 - Idler wheel

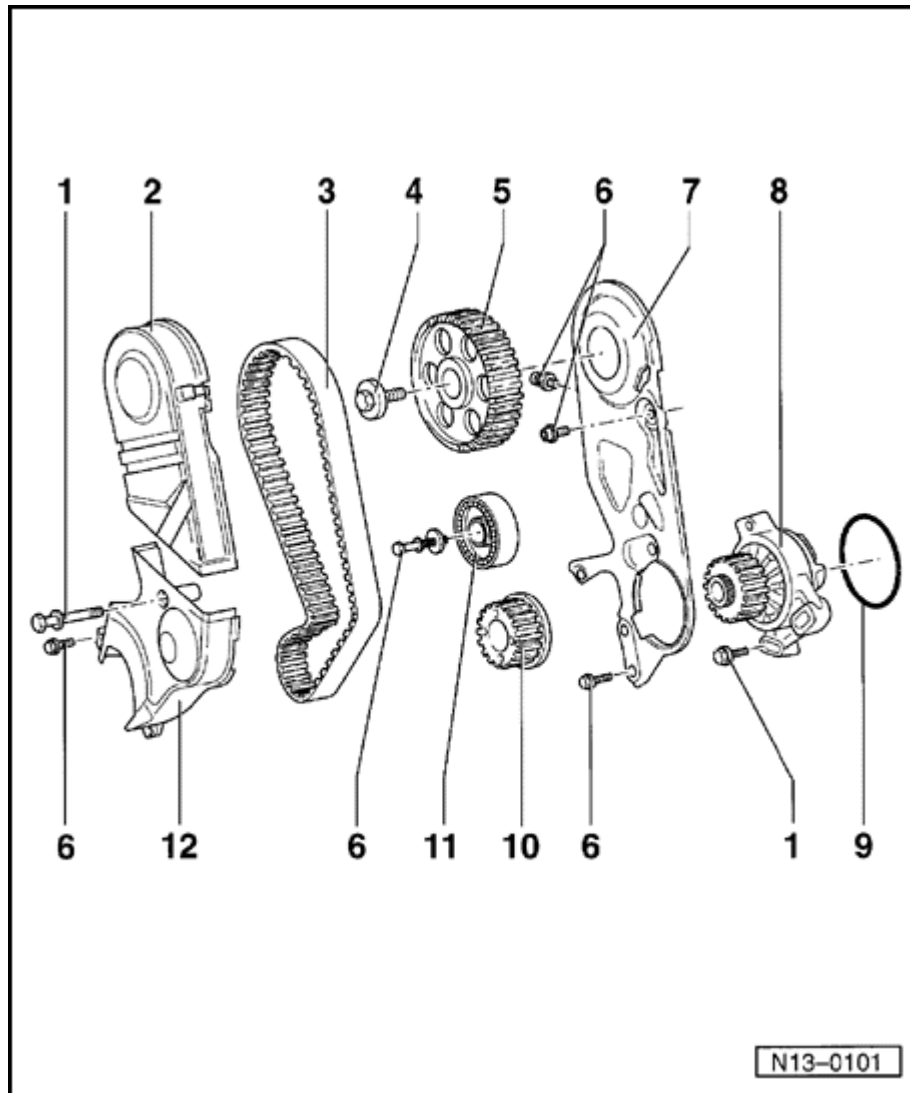
### 26 - Tensioning lever

### 27 - Tensioning roller securing bolt

### 28 - Tensioner

- ◆ Engine code AAB, ACV

### 29 - 20 Nm



## Part II, ➤01.95

**1 - 20 Nm**

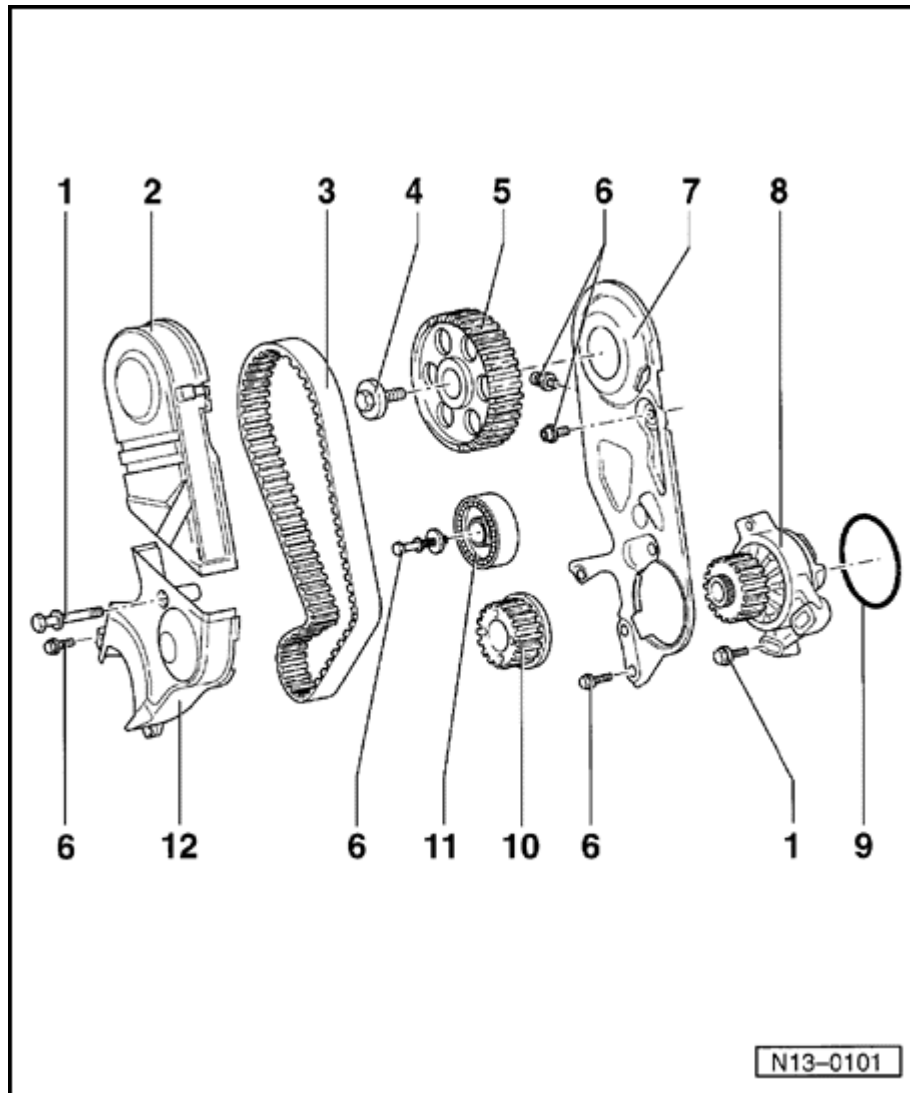
**2 - Toothed belt guard - upper part**

**3 - Camshaft toothed belt**

- ◆ Mark direction of rotation before removing
- ◆ Check for wear
- ◆ Do not kink
- ◆ Removing, installing and tensioning ⇒ [Page 13-34](#)

**4 - Camshaft sprocket securing bolt**

- ◆ Observe steel type marking on bolt head:  
8.8 = 85 Nm  
10.9 = 100 Nm
- ◆ Counter-hold with 3036 to loosen and tighten



### 5 - Camshaft sprocket

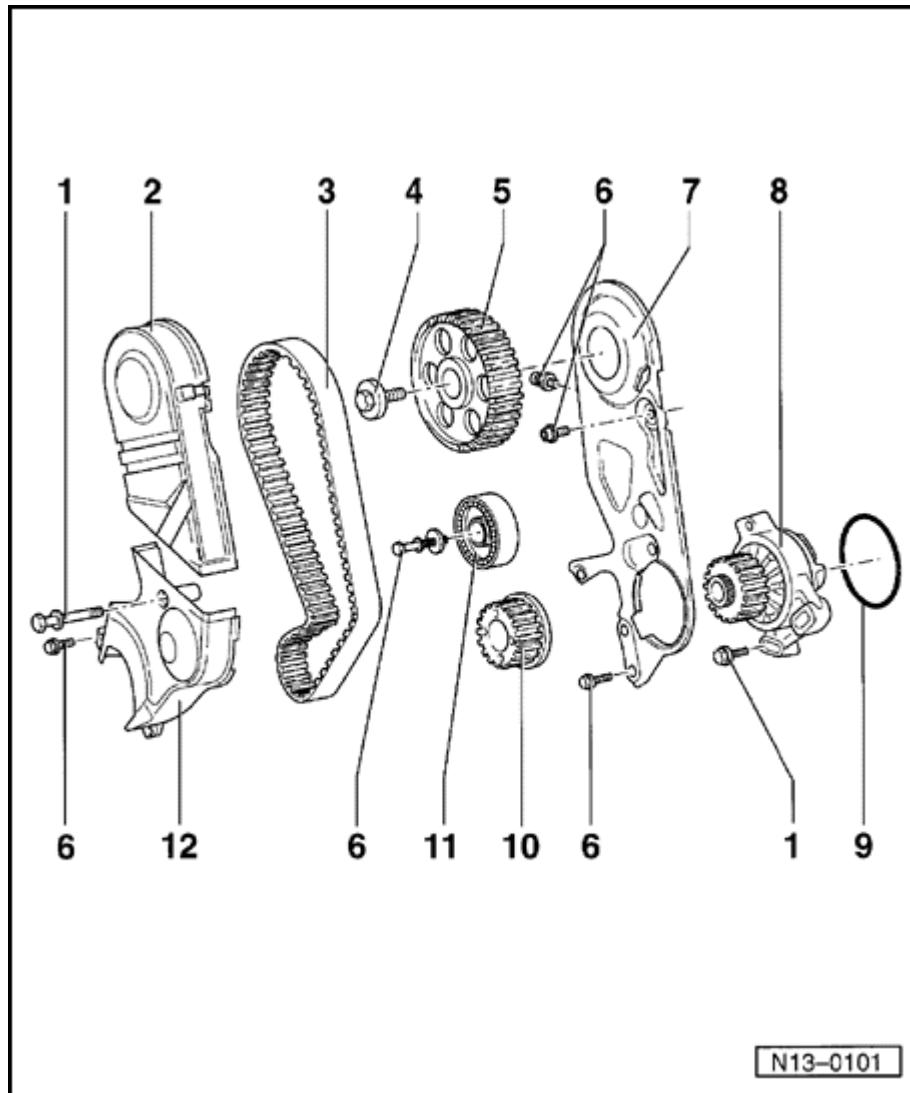
- ◆ Drive off camshaft taper using hammer and drift through toothed belt guard openings
- ◆ Note position when installing toothed belt ⇒ [Page 13-34](#) , Removing, installing and tensioning camshaft toothed belt

6 - 10 Nm

### 7 - Toothed belt guard - rear

### 8 - Coolant pump

- ◆ With elongated holes
- ◆ Check for ease of movement
- ◆ If damaged or leaking replace complete
- ◆ Loosen slightly and turn with screwdriver to tighten toothed belt ⇒ [Page 13-34](#) , Removing and installing camshaft toothed belt



### 9 - O-Ring

- ◆ If leaking and damaged replace

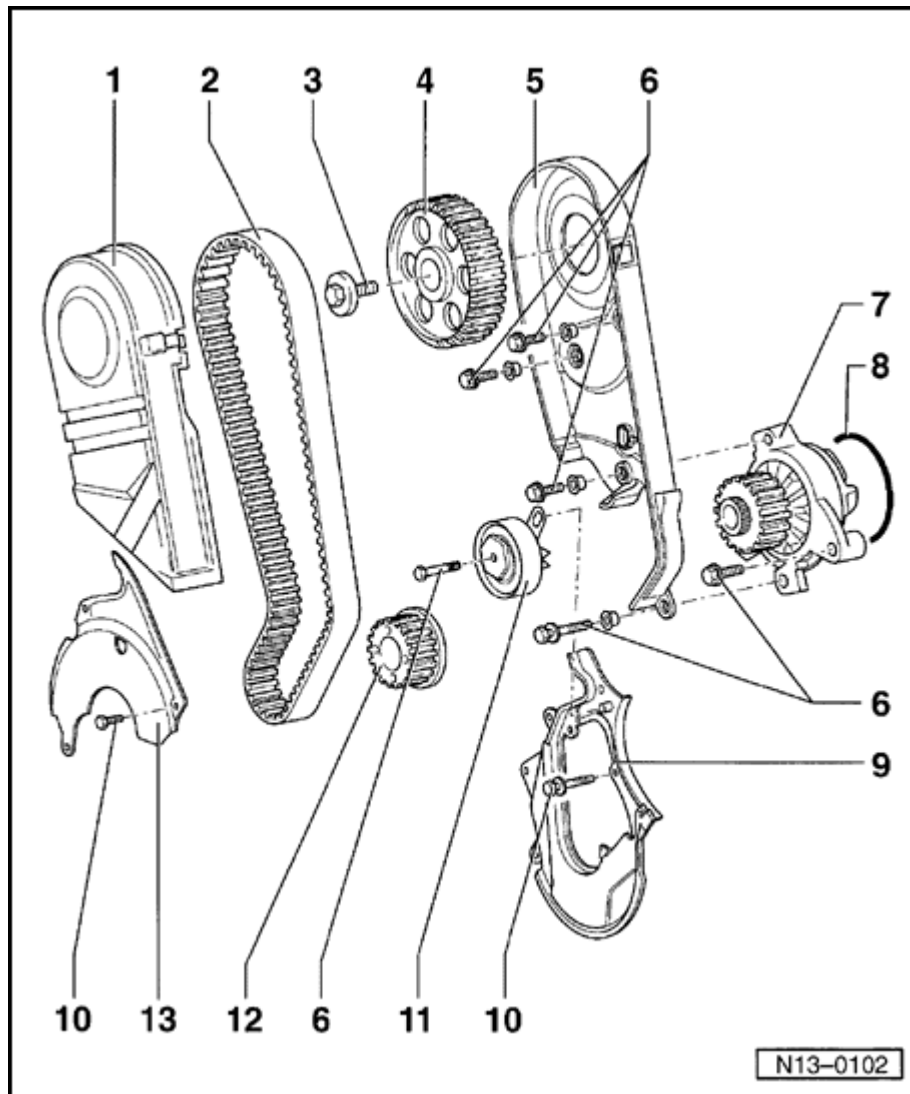
### 10 - Crankshaft toothed belt sprocket

- ◆ Removing and installing ⇒ [Page 13-34](#) ,  
Removing, installing and tightening  
camshaft toothed belt

### 11 - Idler wheel

- ◆ Remove using puller 3034 and bolt 3034/1

### 12 - Toothed belt guard - lower part



## Part II, 02.95 ➤

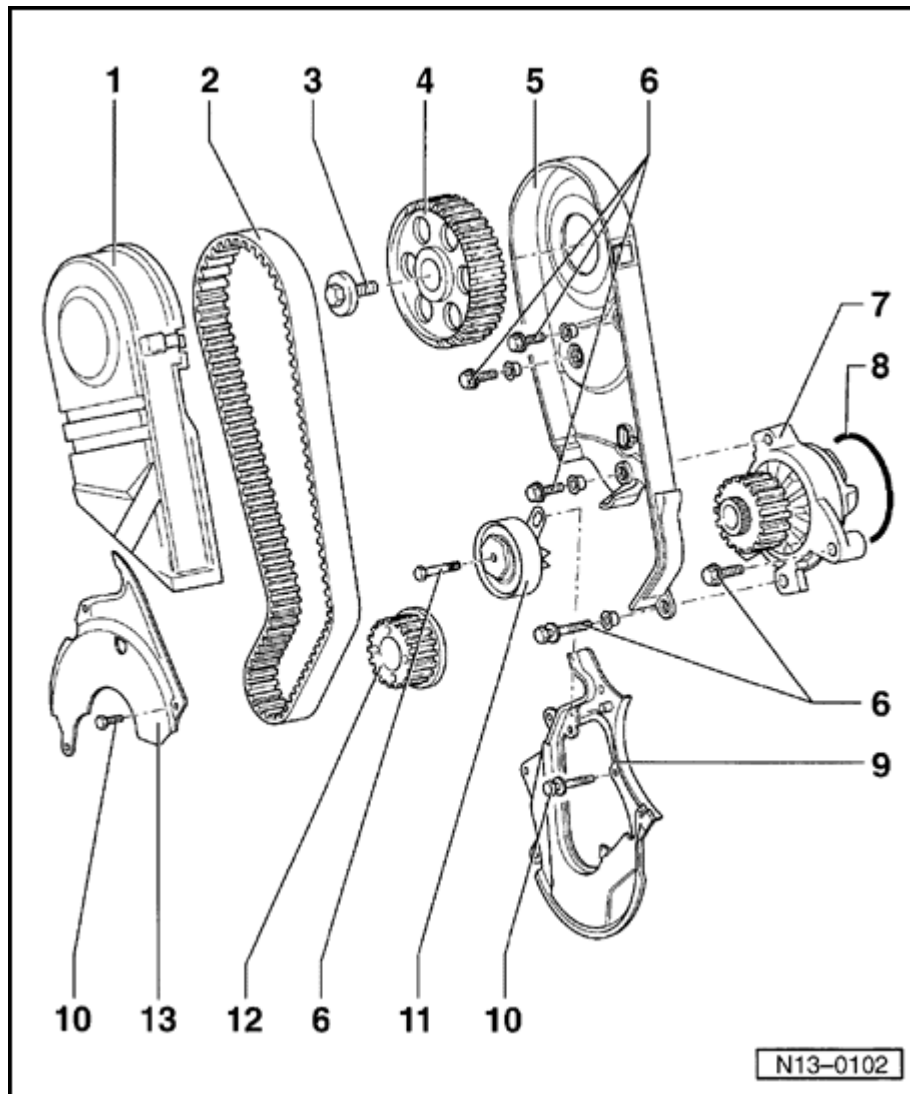
### 1 - Toothed belt guard - upper part

### 2 - Camshaft toothed belt

- ◆ Mark direction of rotation before removing
- ◆ Check for wear
- ◆ Do not kink
- ◆ Removing, installing and tightening ⇒ [Page 13-45](#)

### 3 - Camshaft sprocket securing bolt

- ◆ Observe steel type marking on bolt head:
  - 8.8 = 85 Nm
  - 10.9 = 100 Nm
- ◆ Counter-hold with 3036 to loosen and tighten



#### 4 - Camshaft sprocket

- ◆ Drive off camshaft taper using hammer and drift through toothed belt guard openings
- ◆ Note position when installing toothed belt  
⇒ [Page 13-45](#) , Removing, installing and tightening camshaft toothed belt

#### 5 - Toothed belt guard - rear

6 - 20 Nm

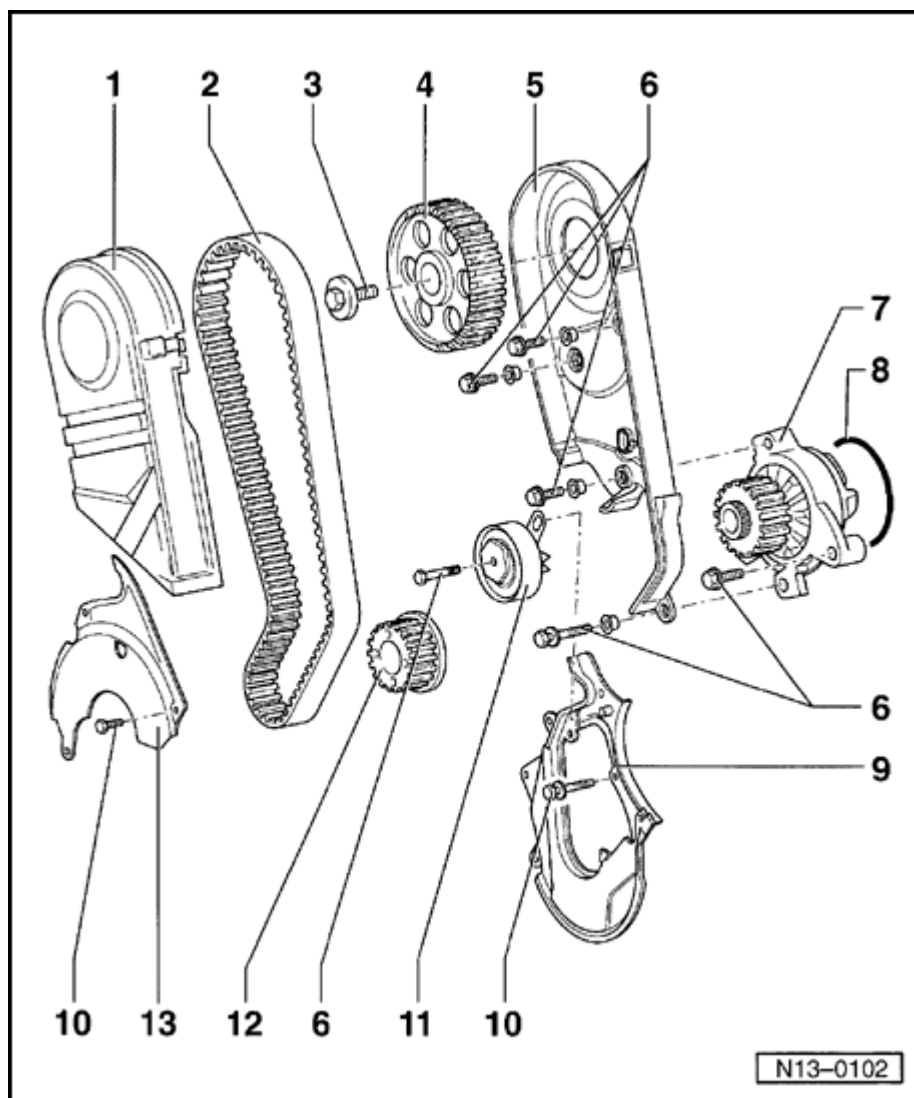
#### 7 - Coolant pump

- ◆ Without elongated holes
- ◆ Check for ease of movement
- ◆ If damaged or leaking replace complete

#### 8 - O-Ring

- ◆ If leaking and damaged replace

#### 9 - Toothed belt guard - lower part



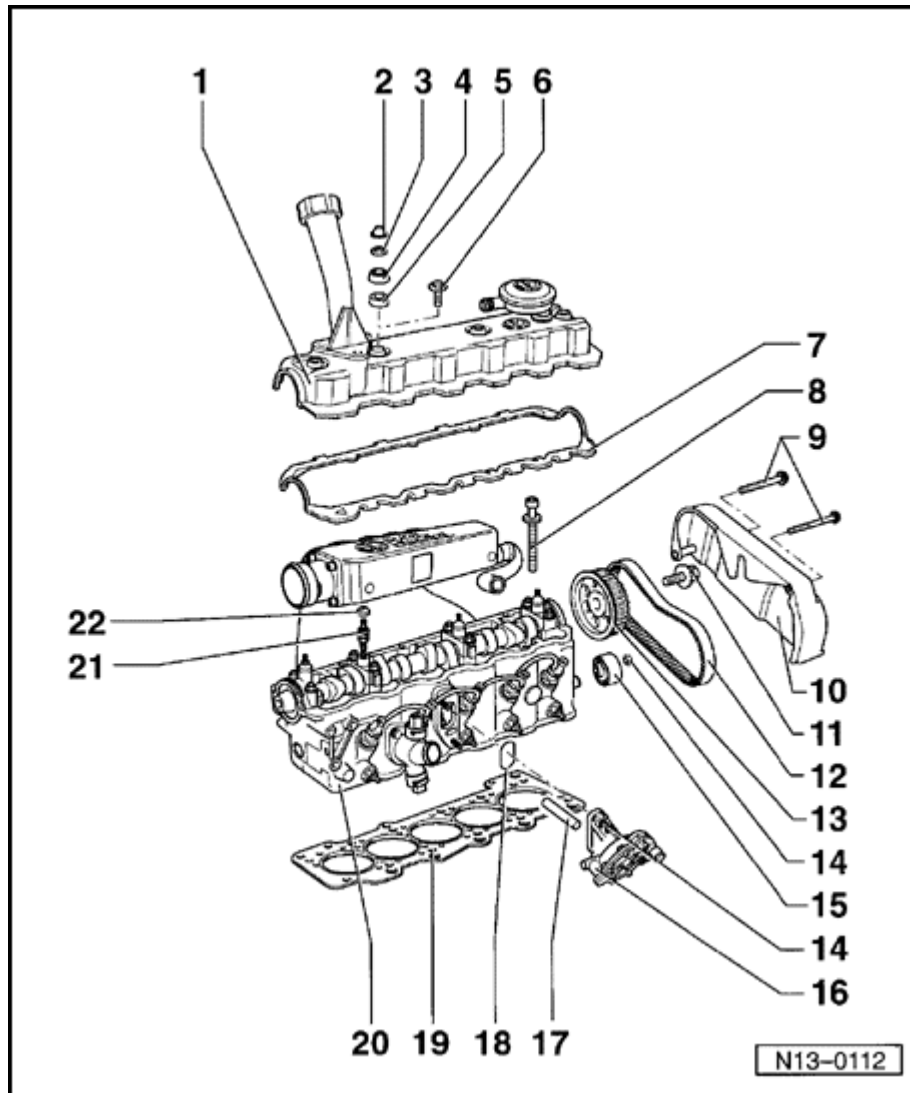
**10 - 10 Nm**

**11 - Tensioning roller**

**12 - Crankshaft toothed belt sprocket**

- ◆ Removing and installing ⇒ [Page 13-45](#) ,  
Removing, installing and tightening  
camshaft toothed belt

**13 - Toothed belt guard**



### Part III

#### 1 - Cylinder head cover

- ◆ Engine code: AAB
- ◆ For engine code ACV, the cylinder head cover is secured to bearing cap with hex bolts

#### 2 - Cover cap

- ◆ Engine code: AAB

#### 3 - 10 Nm

- ◆ Engine code: AAB

#### 4 - Dished washer

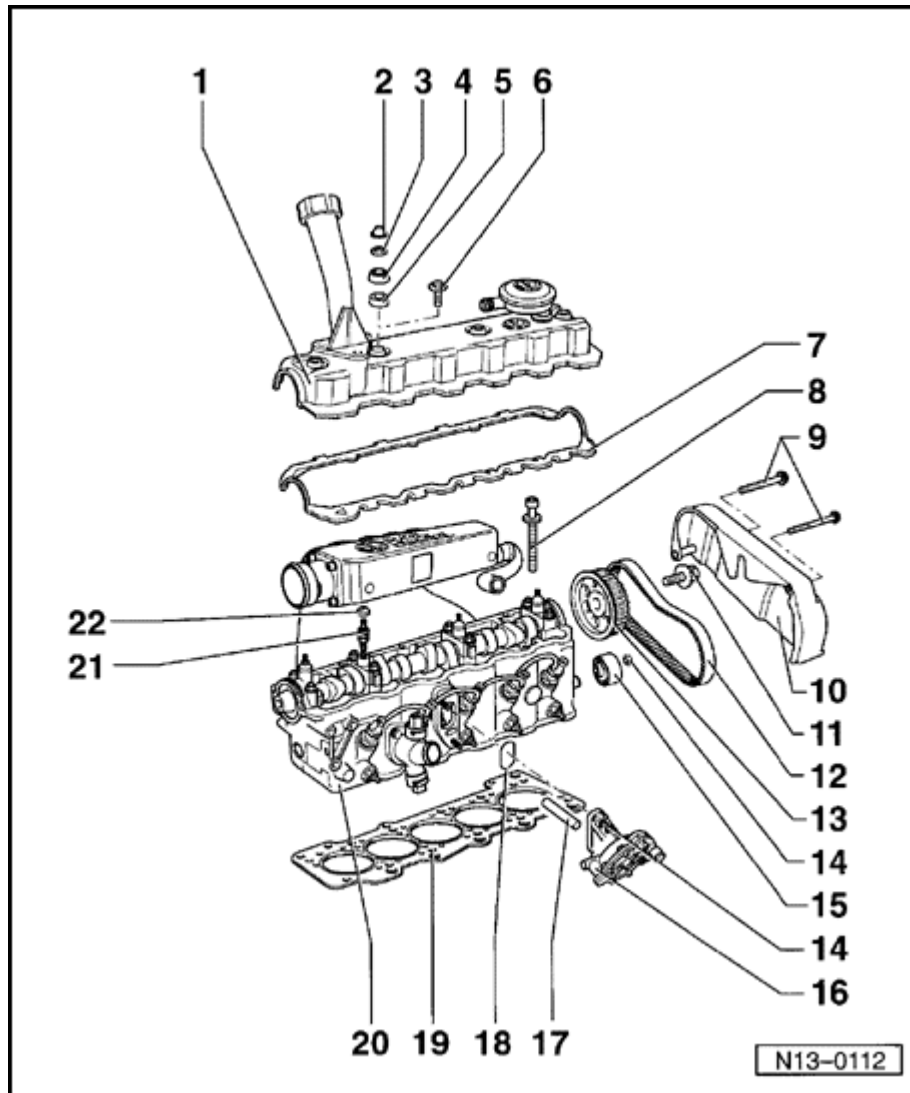
- ◆ Engine code: AAB

#### 5 - Upper sealing washer

- ◆ Engine code: AAB
- ◆ Replace if damaged

#### 6 - 10 Nm

- ◆ Engine code ACV



### 7 - Cylinder head cover gasket

- ◆ Replace if damaged
- ◆ Insert into groove on cylinder head cover

### 8 - Cylinder head bolt

- ◆ Replace
- ◆ Note sequence when loosening and tightening ⇒ [Page 15-10](#) , Installing cylinder head

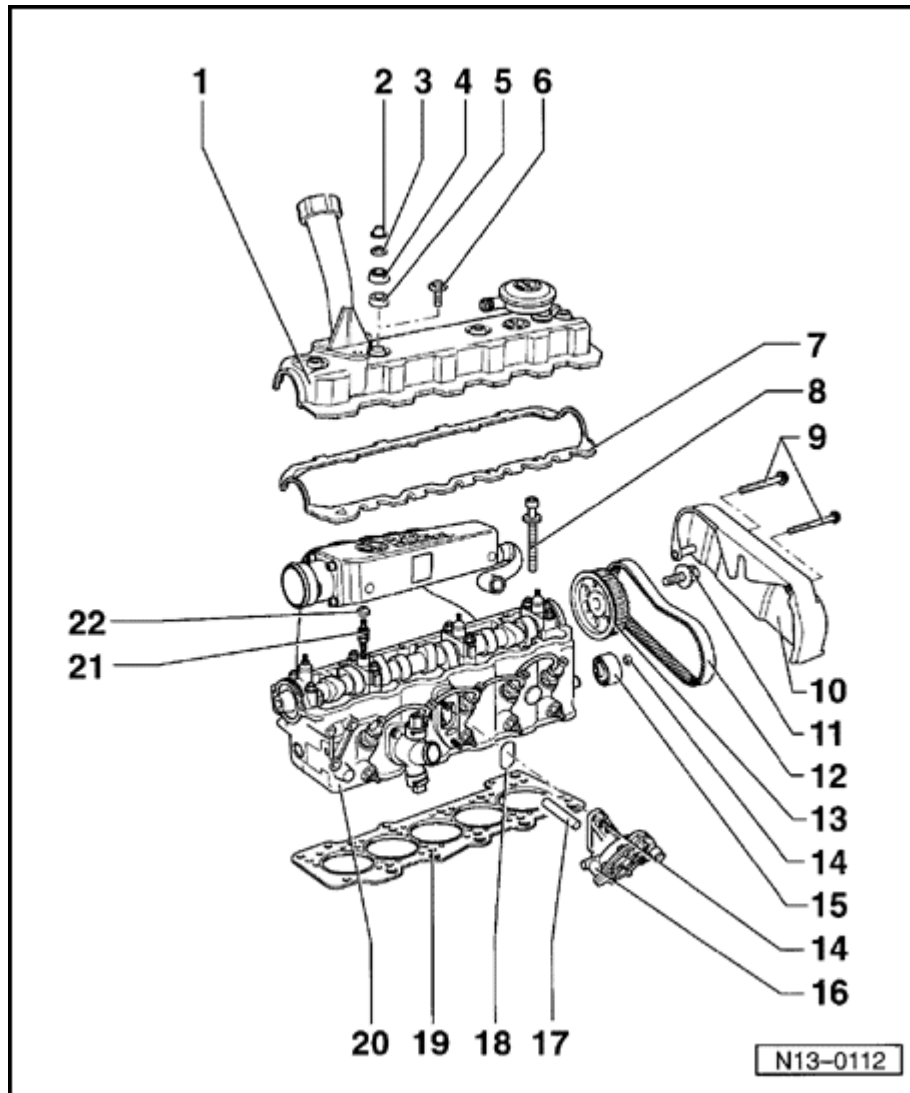
### 9 - Toothed belt guard securing bolt

- ◆ M6 = 10 Nm
- ◆ M8 = 20 Nm

### 10 - Toothed belt guard

### 11 - Injection pump sprocket securing bolt

- ◆ Engine code AAB: 100 Nm
- ◆ Engine code ACV: 160 Nm
- ◆ Oil threads and contact surface
- ◆ Counter-hold with 3036 to loosen and tighten



## 12 - Injection pump toothed belt

- ◆ Mark direction of rotation before removing
- ◆ Check for wear
- ◆ Do not kink
- ◆ Removing, installing and tightening:

Engine code AAB ⇒ [Page 13-54](#)

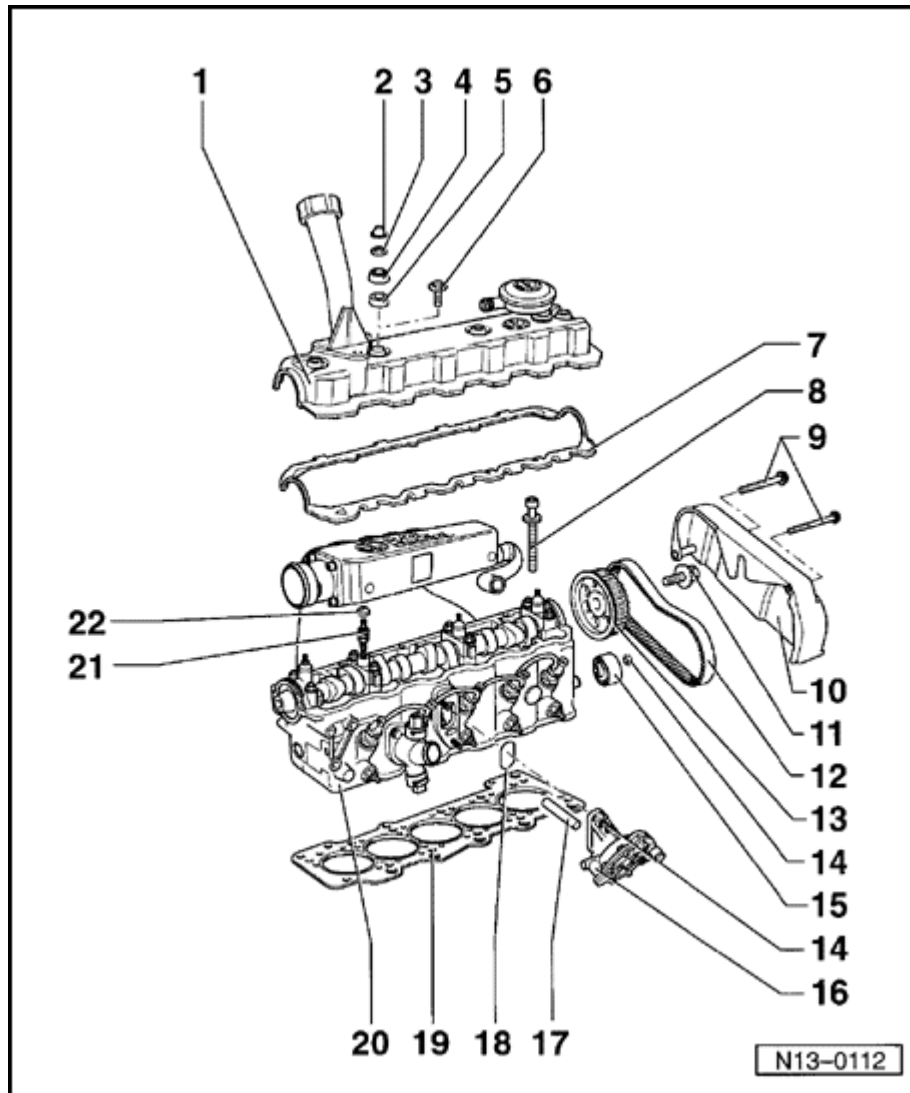
Engine code ACV ⇒ [Page 13-61](#)

## 13 - Injection pump sprocket

- ◆ Note position when installing toothed belt:

Engine code AAB ⇒ [Page 13-54](#) ,  
Removing, installing and tightening injection  
pump toothed belt;

Engine code ACV ⇒ [Page 13-61](#) ,  
Removing, installing and tightening injection  
pump toothed belt



**14 - 20 Nm**

**15 - Idler roller**

- ◆ Engine code ACV
- ◆ Note installation position ⇒ [Page 13-61](#) ,  
Removing, installing and tightening  
injection pump toothed belt

**16 - Vacuum pump**

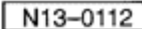
**17 - Plunger**

**18 - O-Ring**

- ◆ Always replace

**19 - Cylinder head gasket**

- ◆ Always replace
- ◆ Note marking ⇒ [Page 13-95](#)
- ◆ If replaced, replace coolant

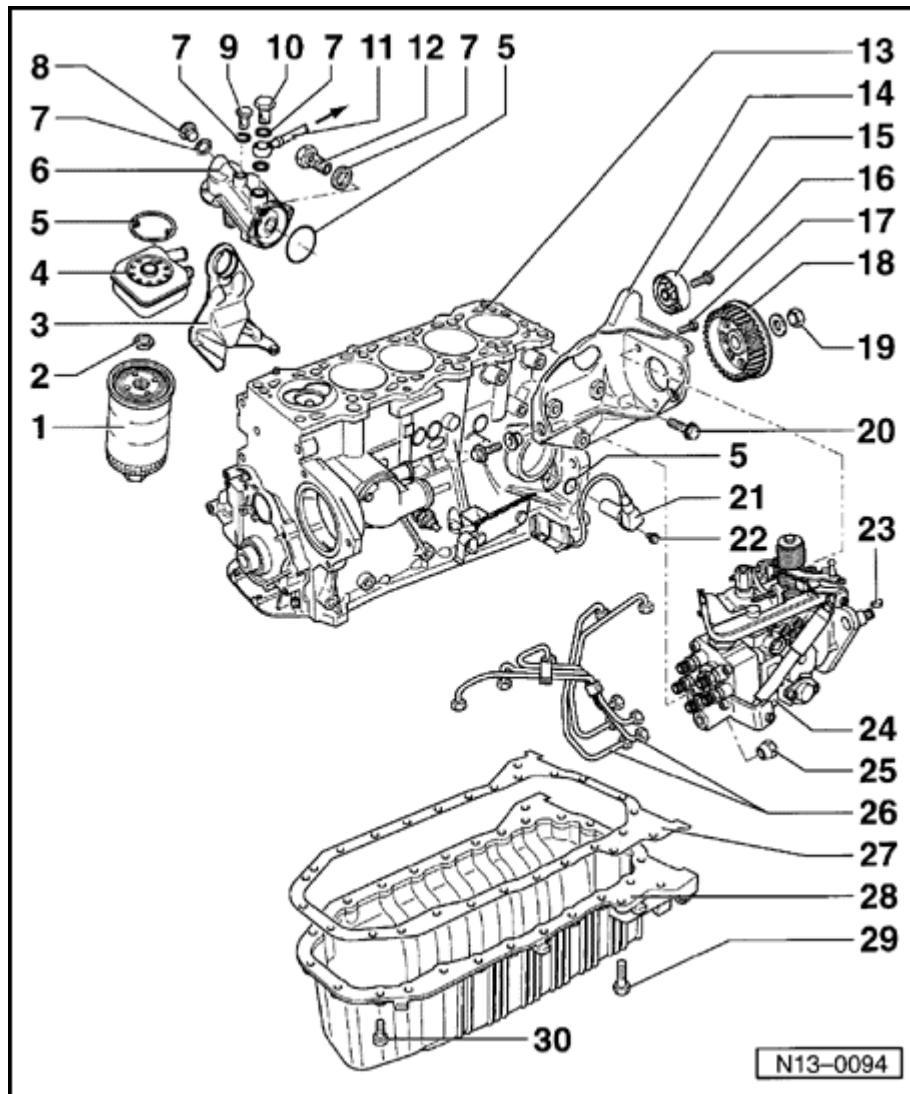


- ◆ Installing ⇒ [Page 15-10](#)
- ◆ If replaced, replace coolant

**21 - 15 Nm**

◆ Engine code: AAB

- ◆ Engine code: AAB
- ◆ Replace if damaged



## Part IV

### 1 - Oil filter

- ◆ Loosen with strap wrench
- ◆ Tighten by hand
- ◆ Note instructions on filter when installing

### 2 - 25 Nm

### 3 - Oil collector

### 4 - Oil cooler

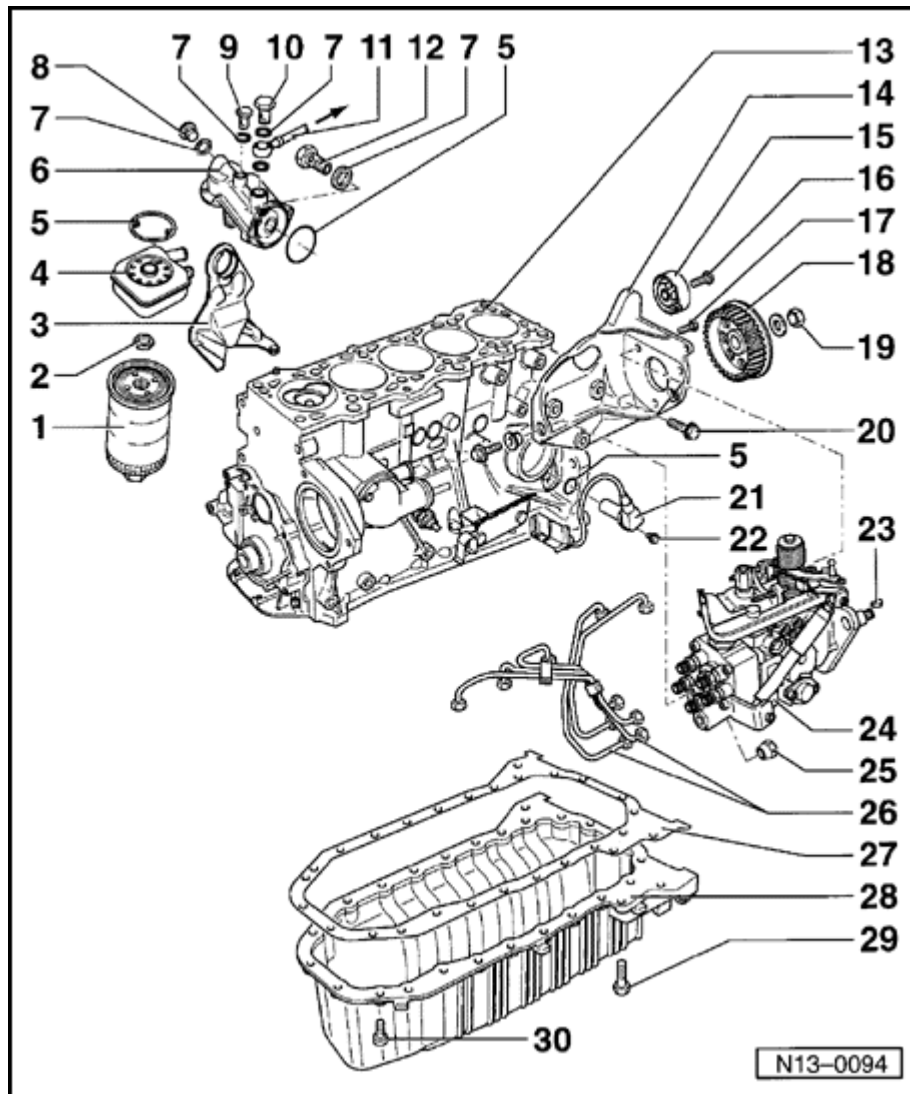
- ◆ Coat contact area to flange, outside the seal, with AMV 188 100 02
- ◆ Ensure clearance to adjacent components
- ◆ See note ⇒ [Page 13-1](#)

### 5 - O-Ring

- ◆ Replace if damaged

### 6 - Oil filter bracket

- ◆ Installation position determined by installed pin



### 7 - Sealing ring

- ◆ Replace

### 8 - Sealing plug, 40 Nm

### 9 - Sealing plug, 20 Nm

### 10 - Banjo bolt, 30 Nm

### 11 - Oil supply line

- ◆ Engine code ACV

- ◆ To turbocharger

### 12 - Banjo bolt, 70 Nm

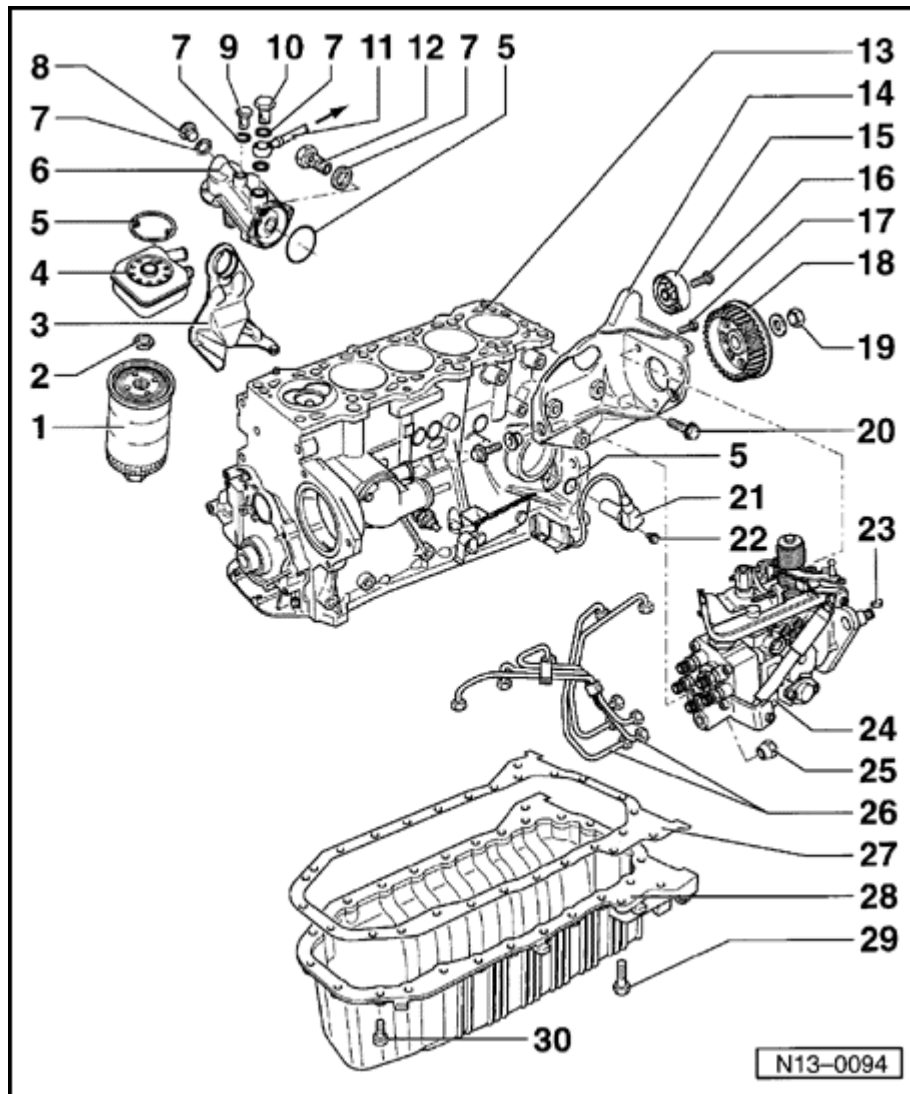
### 13 - Cylinder block

- ◆ Removing and installing sealing flange and flywheel ⇒ [Page 13-70](#)

- ◆ Removing and installing crankshaft ⇒ [Page 13-80](#)

- ◆ Disassembling and assembling pistons and connecting rods ⇒ [Page 13-84](#)

### 14 - Console



### 15 - Tensioner

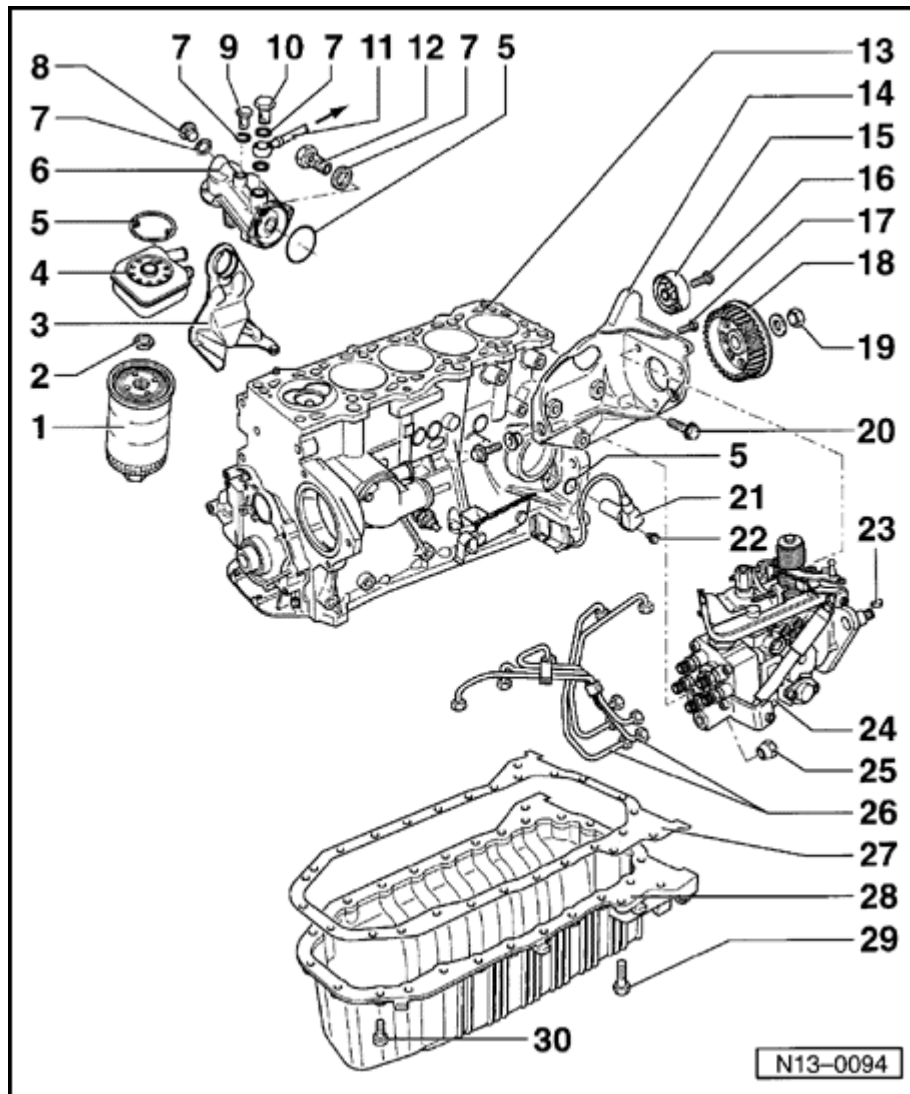
- ◆ Engine code ACV
- ◆ Removing and installing ⇒ [Page 13-61](#) ,  
Removing and installing injection pump  
toothed belt

16 - 15 Nm

17 - 30 Nm

18 - Injection pump sprocket

⇒ [Repair Manual , 2.4 Liter 5-Cyl. 2V Diesel Fuel Injection & Glow Plug, Engine Code: AAB, Repair Group 23; Removing and installing injectors](#)



### 19 - Injection pump sprocket securing bolt

- ◆ Engine code AAB 50 Nm
- ◆ Engine code ACV 90 Nm
- ◆ Counter-hold with 3036 to loosen and tighten

### 20 - Console securing bolt

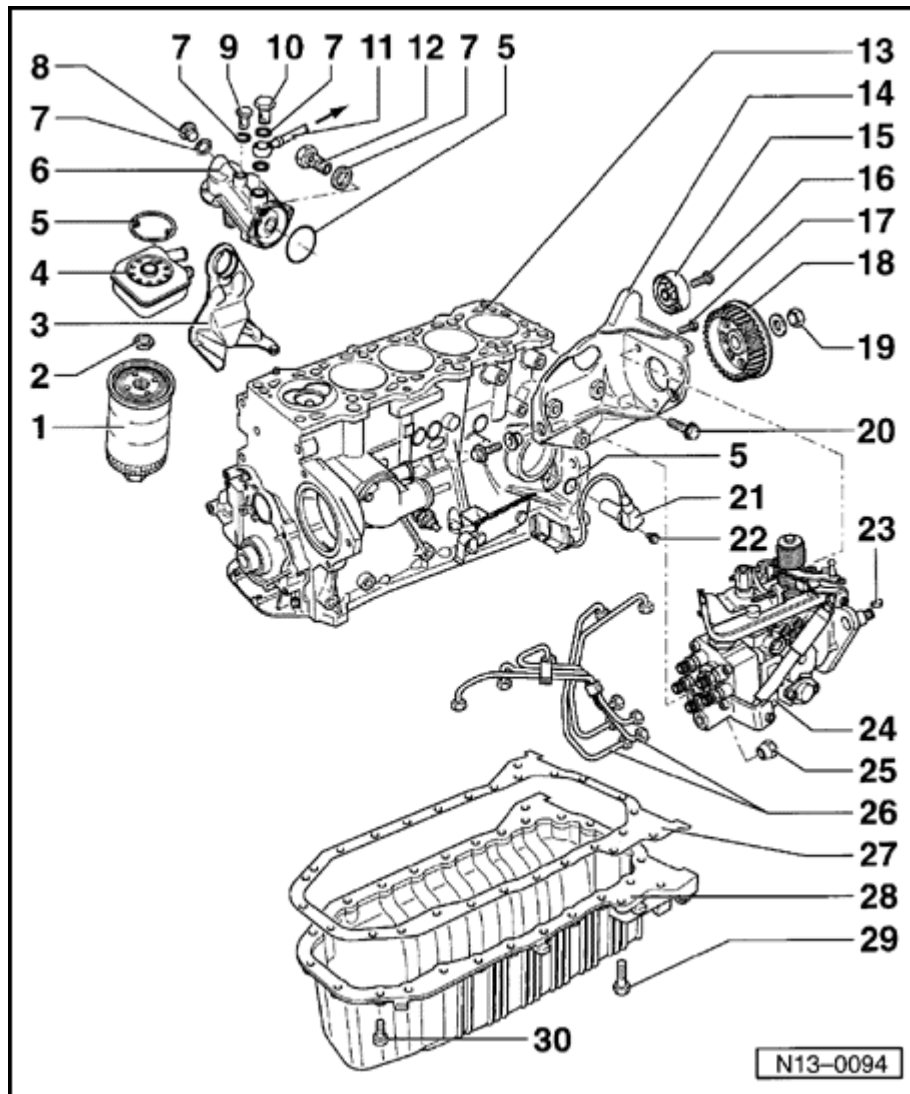
- ◆ Engine code AAB 50 Nm
- ◆ Engine code ACV 45 Nm

### 21 - Engine speed sensor -G28-

22 - 10 Nm

### 23 - Woodruff key

- ◆ Check for tight fit



## 24 - Injection pump

⇒ [Repair Manual , 2.4 Liter 5-Cyl. 2V Diesel Fuel Injection & Glow Plug, Engine Code: AAB, Repair Group 23; Removing and installing injection pump](#)

## 25 - 25 Nm

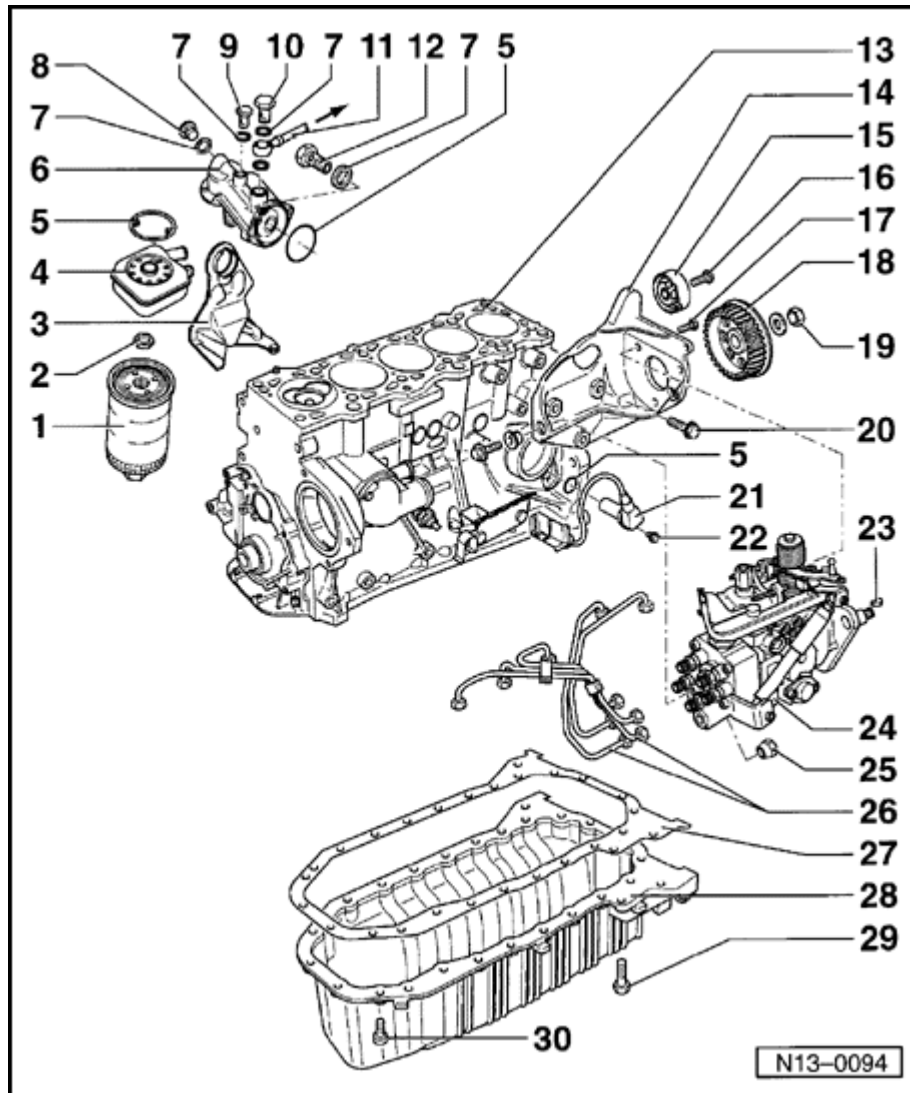
- ◆ With cone

## 26 - Injector lines

- ◆ Tighten to 25 Nm
- ◆ Remove with ring wrench 3035
- ◆ Always remove injector lines complete
- ◆ Do not alter shape

## 27 - Sump gasket

- ◆ Replace
- ◆ M8, install bolt with hex head to transmission side



### 28 - Sump

- ◆ Clean sealing surface before installing

### 29 - 20 Nm

- ◆ M8, install bolt with hex head to transmission side

### 30 - 10 Nm

- ◆ Remove and install with socket 3249
- ◆ With flywheel installed: Turn flywheel so that cut-outs align with bolts



## Generator V-belt tension, adjusting

(Only vehicles ➤01.95 with toothed rack tensioner)

### Special tools and equipment required



- ◆ VAG 1410/2 Ring insert
- ◆ VAG 1410 Torque wrench (4 - 20 Nm)
- ◆ VAG 1331 Torque wrench (5 - 50 Nm)

### Work sequence

- Removing insulation tray:

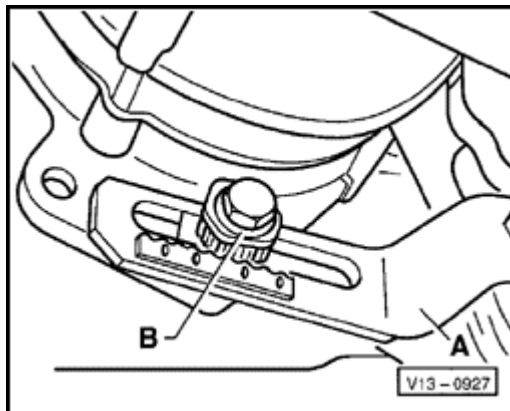
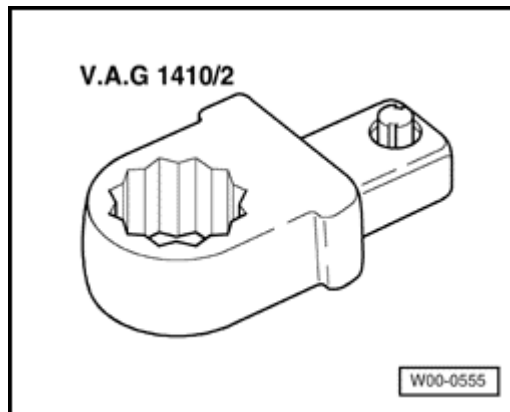
⇒ [Repair Manual , Body Exterior, Repair Group 50; Removing insulation tray](#)



- Loosen all securing bolts for tensioning bracket -A- and generator at least one turn.

### Note:

*It must be possible to move the generator easily by hand.*





- Tension V-belt by turning the tensioning nut -B- with torque wrench Specification:

New V-belt 8 Nm

Used V-belt 4 Nm

- Tighten tensioning nut securing bolt to 30 Nm.
- Tighten generator mounting securing bolt to 35 Nm and tensioning bracket to cylinder head/lifting eye to 25 Nm.



## Ribbed belt, removing and installing

(Only vehicles 02.95 ➤ with tensioning roller)

Engine codes AAB, ACV

### Special tools and equipment required



- ◆ 3299 Lever

#### **Note:**

*Before removing the ribbed belt, mark the direction of rotation. When installing the belt make sure it is correctly seated in the pulley.*

### Removing ribbed belt

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

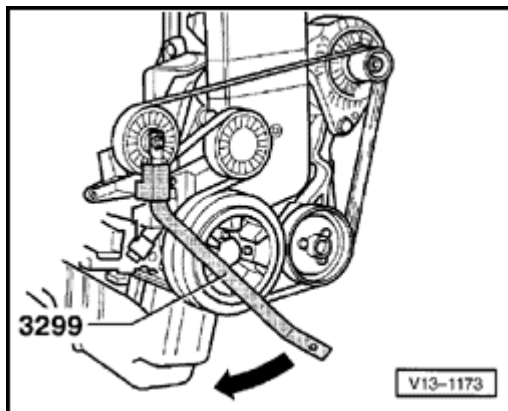
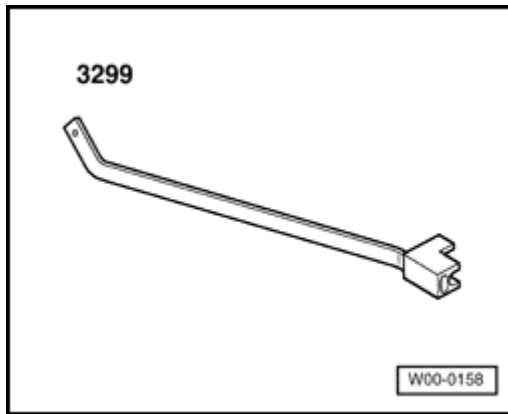


- Lift tensioning roller with lever 3299 and remove ribbed belt from the generator pulley.
- Remove ribbed belt.

### Installing ribbed belt

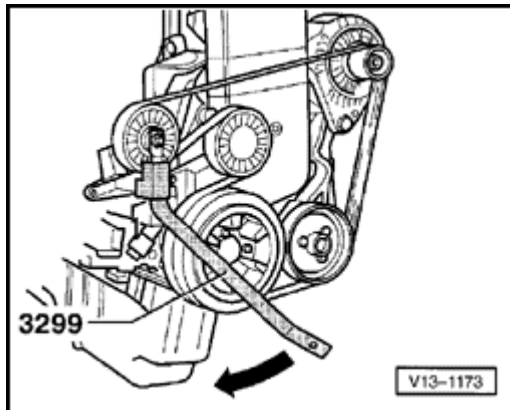
#### **Note:**

*Before installing the ribbed belt, make sure that all sub-assemblies (generator, air conditioner compressor, vane pump) are tight.*

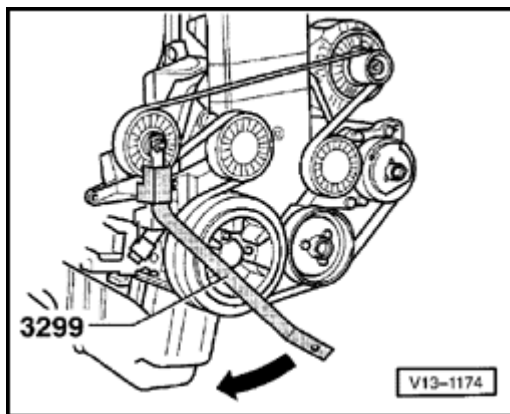




- Place ribbed belt on ribbed belt pulley with vibration damper.
- Lift tensioning roller with lever 3299, install ribbed belt and tighten.



➤ Belt drive without air conditioner compressor



➤ Belt drive with air conditioner compressor

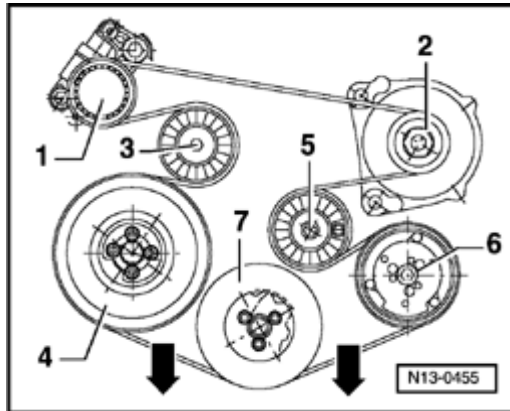
- Start engine and check belt running.

**Note:**

*Before removing the ribbed belt, mark the direction of rotation. When installing the belt make sure it is correctly seated in the pulley.*

**Removing ribbed belt**

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

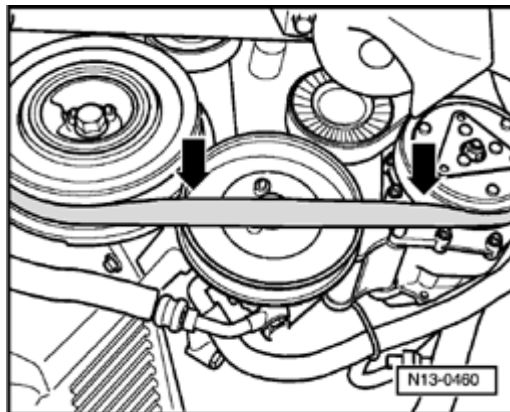


A

- Grasp the ribbed belt on the left and right-hand sides of the power steering vane pump -7- with both hands.
- Slowly pull the ribbed belt in direction of arrow using substantial force and remove it from the power steering vane pump -7- and then from the other belt pulleys.

### Installing ribbed belt






- First place the ribbed belt on tensioning roller -1-, then on generator -2-, idler roller -3-, vibration damper -4-, idler roller -5- and as far as possible on air conditioner compressor -6-.



A

- Grasp the ribbed belt -arrows- with both hands and slowly pull it over power steering vane pump.
- Turn engine over by hand in engine direction of rotation and make sure ribbed belt seats correctly in the running grooves in the belt pulley.
- Start engine and check belt running.



<p>3227</p> 	<p>V.A.G 1383 A</p> 
<p>V.A.G 1921</p> 	<p>V.A.G 1331</p> 
<p>V.A.G 1332</p> 	<p>W13-0041</p>

## Ribbed belt tensioning device, removing and installing

(Only for vehicles 02.95 ➤ with tensioning roller)

**Engine codes AAB, ACV**

### Special tools and equipment required

- ◆ 3227 Engine stand
- ◆ VAG 1383 A Engine/transmission jack
- ◆ VAG 1921 Spring-type clip pliers
- ◆ VAG 1331 Torque wrench (5...50 Nm)
- ◆ VAG 1332 Torque wrench (40...200 Nm)
- ◆ Wooden wedge



## Removing

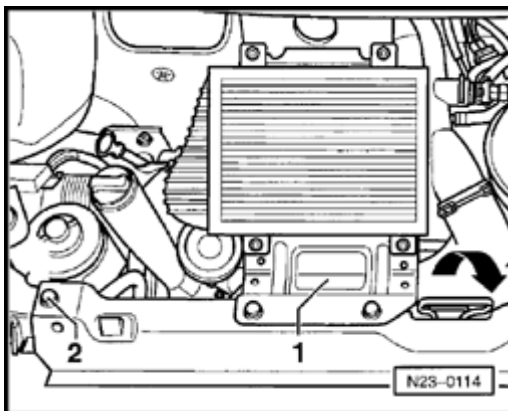
- Remove ribbed belt ⇒ [Page 13-27](#) .

⇒ [Repair Manual , Body Exterior, Repair Group 66; Servicing radiator grille](#)

## Engine code ACV, AUF

A

- Remove charge air cooler bracket -1-.
- Remove charged air cooler with air hoses ⇒ [Page 21-7](#) , removing and installing parts of charge air cooling.



## Continued for all vehicles

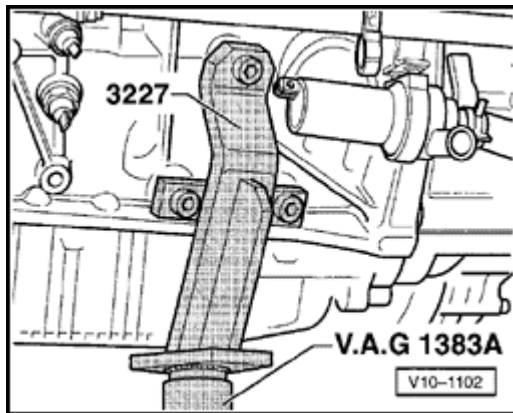
- Remove left and right-hand securing bolts -2-.
- Fold lock carrier and radiator out forward -arrow-.
- Disconnect power steering vane pump hydraulic lines from engine.

⇒ [Repair Manual , Suspension, Wheels, Brakes, Steering m.y. 1992-1996, Repair Group 48; Assembly overview: vane pump, reservoir, hydraulic lines](#)

- Unbolt right-hand driveshaft at transmission:

⇒ [Repair Manual , Suspension, Wheels, Brakes, Steering m.y. 1992-](#)

1996, Repair Group 40; Removing and installing driveshaft



A

- Bolt engine stand 3227 onto cylinder block and tighten to approx. 20 Nm.
- Lift engine and transmission lightly with engine and transmission jack VAG 1383 A.
- Remove transmission mountings:
  - ◆ Engine code AAB

⇒ [Repair Manual , 5 Spd. Manual Transmission 02B, Repair Group 34; Removing and installing transmission](#)

- ◆ Engine code ACV

⇒ [Repair Manual , 5 Spd. Manual Transmission 02G, Repair Group 34; Removing and installing transmission](#)

- Remove right-hand engine mounting center bolt(s).

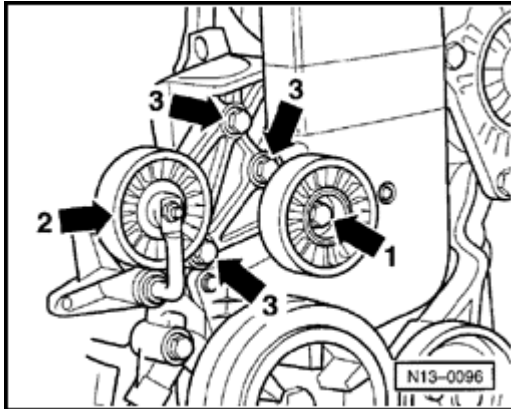
**Note:**

- ◆ *When lowering engine make sure that front exhaust line does not lie on steering gear.*
- ◆ *When pushing engine forward make sure that cables, lines and hoses are not overstretched.*



A

- Lower engine with engine and transmission jack VAG 1383 A as far as possible, push forward and prevent from swinging back by securing with wooden wedge -arrow-.



A

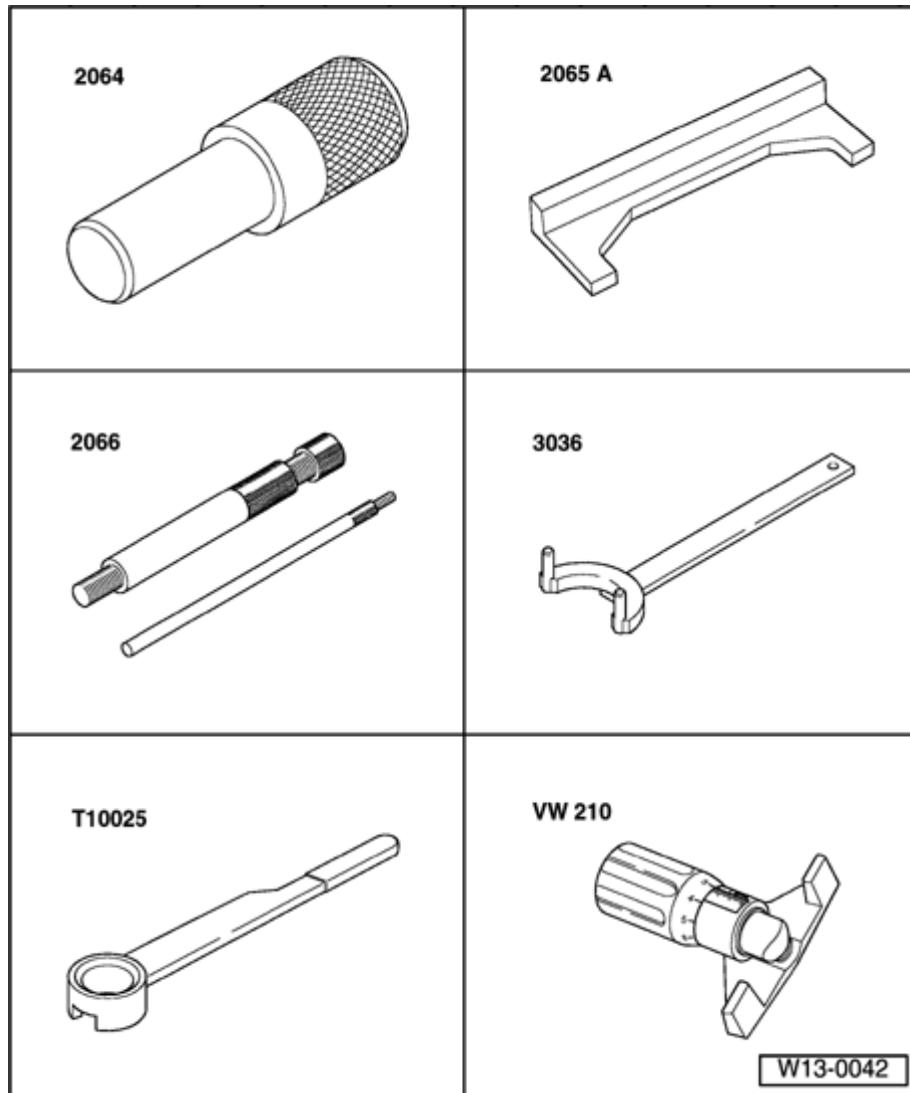
- Remove ribbed V-belt idler roller -arrow 1-.
- Remove ribbed V-belt tensioning roller -arrow 2-.
- Remove tensioning device bracket -arrow 3-.
- Disassembling and assembling tensioning device ⇒ [Page 13-3](#) .

### Installing

Install ribbed V-belt tensioning device in reverse sequence.

### Tightening torques

Screwed or bolted connection	Tightening torque
Bracket to cylinder block	70 Nm
Tensioning roller to tensioning lever	20 Nm
Idler roller to bracket	20 Nm
Center engine mounting bolt M10x60	65 Nm



## Camshaft toothed belt, removing, installing and tensioning (➤01.95)

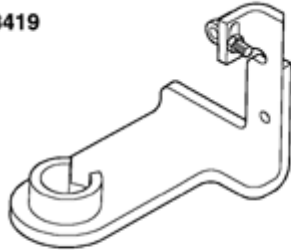
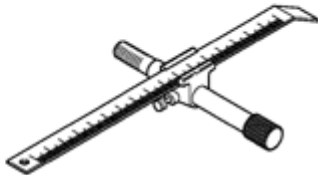



**Vehicles ➤ 01.95 with elongated holes in coolant pump for tensioning toothed belt**

Vehicles 02.95 ➤ with tensioning roller for tensioning toothed belt ⇒ [Page 13-45](#)

### Special tools and equipment required

- ◆ 2064 Pin
- ◆ 2065 A Setting bar
- ◆ 2066 Adapter for dial indicator
- ◆ 3036 Retainer
- ◆ T10025 Counter-hold
- ◆ VW 210 Checking appliance for V-belt and toothed belt



<p><b>3419</b></p> 	<p><b>2068 A</b></p> 
<p><b>V.A.G 1331</b></p> 	<p><b>V.A.G 1332</b></p> 
<p><b>V.A.G 1601</b></p> 	<p><b>W13-0043</b></p>

### Special tools and equipment required

With engine removed:

- ◆ 3419 Counter-hold
- ◆ 2068 A TDC setting device
- ◆ VAG 1331 Torque wrench (5...50 Nm)
- ◆ VAG 1332 Torque wrench (40...200 Nm)
- ◆ VAG 1601 Torque wrench (150...800 Nm)
- ◆ Feeler gauge
- ◆ Dial indicator (measuring range 0...3 mm)



## Removing

- Removing insulation tray:

⇒ [Repair Manual , Body Exterior; Repair Group 50; Removing insulation tray](#)

## Vehicles 09.94 ➤

- Removing radiator grille:

⇒ [Repair Manual , Body Exterior; Repair Group 66; Servicing radiator grille](#)

## Continued for all vehicles

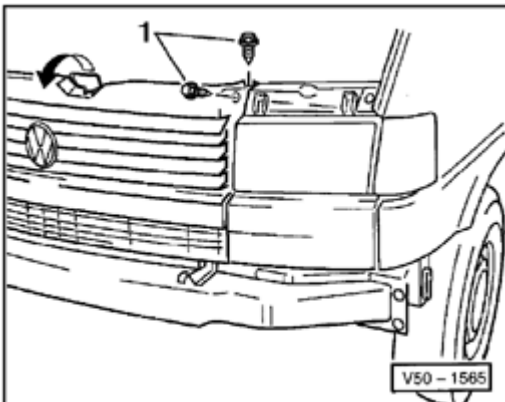
A

- Unbolt left and right-hand securing bolts -1-.

### Note:

*Vehicles 09.94 ➤ one securing bolt is located on each left and right-hand side on lock carrier.*

- Fold lock carrier with radiator out forward -arrow-.



- Removing generator V-belt:

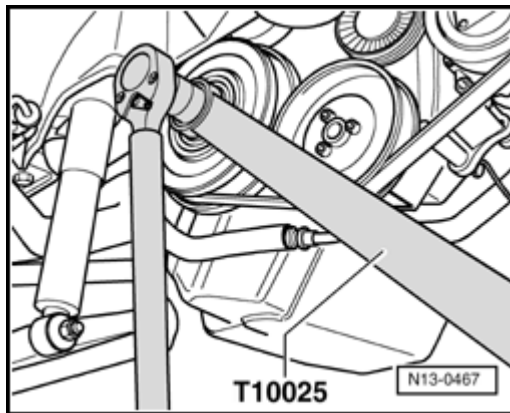
⇒ *Repair Manual , Electrical Equipment, Repair Group 27; Removing and installing generator with V-belt*



- Fold generator up fully and secure.
- Removing V-belt for power steering vane pump:

⇒ *Repair Manual , Suspension, Wheels, Brakes, Steering, Repair Group 48; Assembly overview: Vane pump, reservoir, hydraulic lines*

- Remove cylinder head cover and toothed belt guard for both toothed belts.



**A**

- Insert counter-hold T10025 and loosen vibration damper/toothed belt pulley by loosening center bolt.

**Note:**

*With engine removed, the counter-hold 3419 can also be used.*

- Turn crankshaft to TDC No. 1 cylinder -arrow-.



**A**

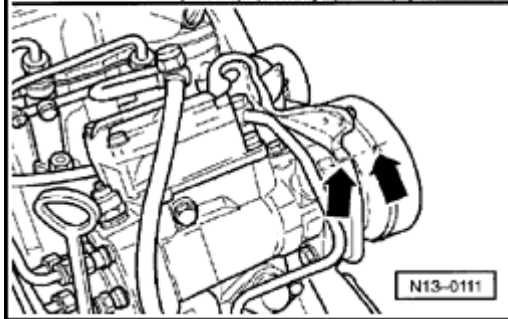
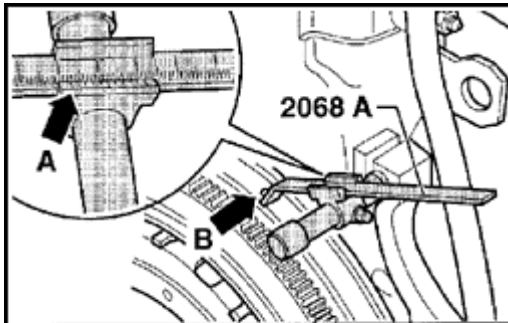
Engine installed

- Marks -arrows- on injection pump sprocket/console -C- and on

flywheel/clutch bell housing -A- or drive plate/clutch bell housing -B- must align.

**Note:**

*This condition only occurs every 2nd TDC position.*



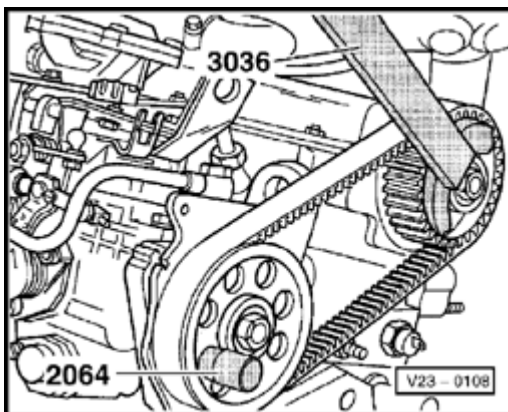
A

Engine removed

- Set TDC setting device 2068 A to 82 mm -arrow A- the left-hand mark on the scale is the reference point.
- Install setting device as shown. Turn crankshaft until TDC mark on flywheel/drive plate aligns with edge of setting device -arrow B- and marks on injection pump sprocket and console also align.

**Note:**

*This condition only occurs every 2nd TDC position.*



A

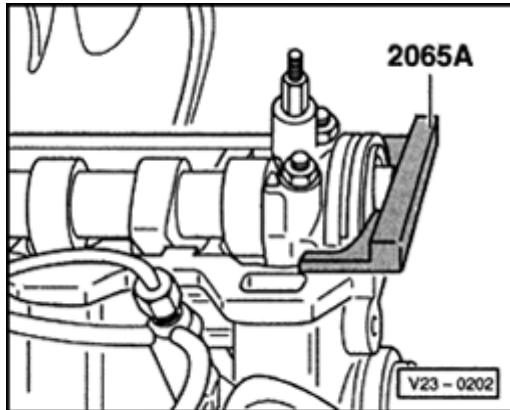
- Lock injection pump sprocket with pin 2064.
- Mark direction of rotation of toothed belt.
- Hold injection pump drive sprocket with counter-hold 3036. Remove securing bolt and take off drive sprocket with toothed belt.
- Remove vibration damper center bolt.
- Remove the 4 x M8 crankshaft vibration damper and toothed belt pulley securing bolts.



- Remove vibration damper.
- Release toothed belt tension (loosen coolant pump).
- Remove lower toothed belt guard.
- Mark direction of rotation of toothed belt.
- Take off toothed belt.

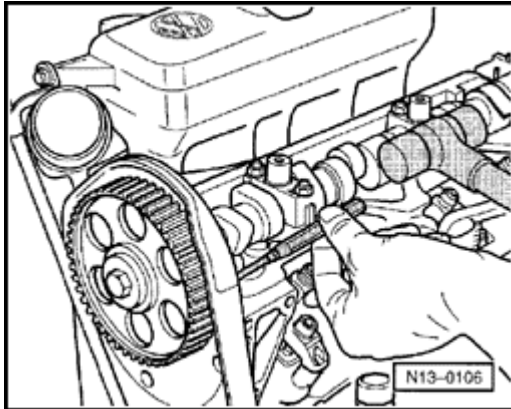
### Installing, tensioning

- Check whether TDC mark on flywheel and reference mark are aligned.



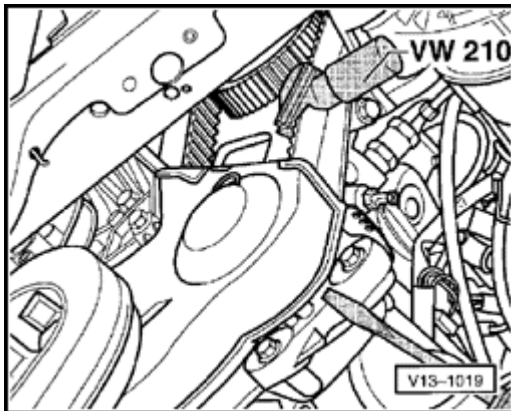
- Lock camshaft with setting bar 2065 A.
- Center setting bar as follows:

Turn camshaft so that one end of setting bar contacts the cylinder head. Using feeler gauge establish the gap at the other end of the setting bar. Place a feeler gauge corresponding to half the gap between setting bar and cylinder head. Turn camshaft until the setting bar contacts the feeler gauge. Place a 2nd feeler gauge, of same thickness, at the other end between setting bar and cylinder head.



A

- Loosen camshaft sprocket securing bolt a  $\frac{1}{2}$  turn. Release camshaft sprocket from camshaft taper by tapping with a hammer (using a drift through rear toothed belt guard opening).
- Install toothed belt for camshaft drive. Note direction of rotation for used belts.
- Install lower toothed belt guard and also install M8 securing bolt for coolant pump.



A

- Adjust toothed belt tension by turning coolant pump with test unit VW 210.

Scale value: 12 to 13

measured between coolant pump and camshaft sprocket.

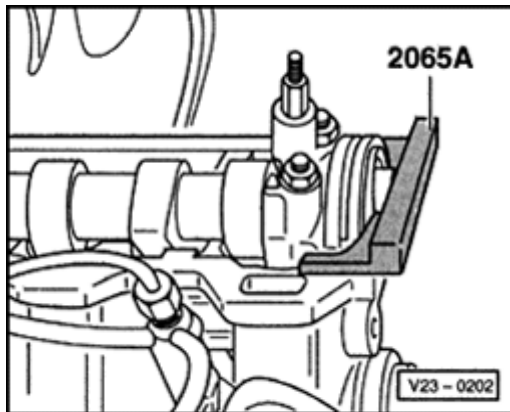
- Tighten coolant pump securing bolts to 20 Nm.
- Tighten lower toothed belt guard.
- Check if crankshaft is still positioned at TDC No. 1 cylinder, correct if necessary.



- Tighten camshaft sprocket securing bolt using counter-hold 3036. Observe steel type marking on bolt head:

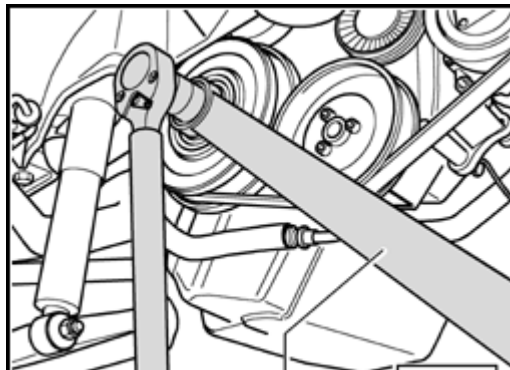
8.8 = 85 Nm

10.9 = 100 Nm



A

- Take setting bar 2065 A off camshaft.



A

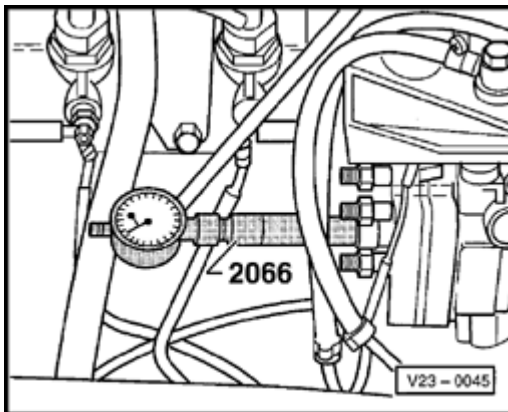
- Insert counter-hold T10025 and tighten crankshaft vibration damper and toothed belt pulley center bolt to 460 Nm.

**Note:**

*With engine removed the counter-hold 3419 can also be used.*



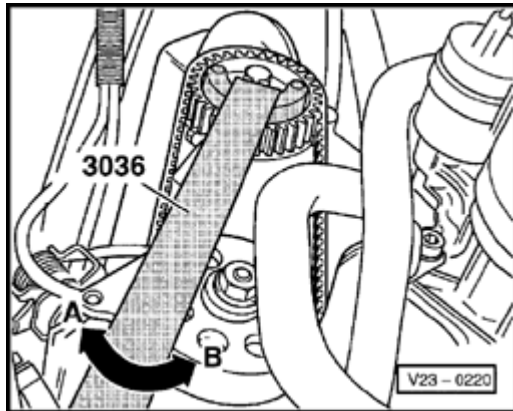
- Tighten the 4 x M8 crankshaft vibration damper and toothed belt pulley securing bolts to 20 Nm.
- Install injection pump drive toothed belt with injection pump drive sprocket. Tighten securing bolt until drive sprocket can be turned by hand. Note direction of rotation for used toothed belts.
- Check toothed belt tension, adjust if necessary  
⇒ [Page 13-54](#) , Removing, installing and tensioning injection pump toothed belt (engine codes AAB).
- Remove pin 2064 from injection pump sprocket.



- Install adapter for gauge 2066 and gauge (measuring range 0 to 3 mm) with 2.0 mm preload in place of sealing plug.
- Check that crankshaft is still on TDC No. 1 cylinder and adjust commencement of injection as follows:

**Note:**

- ◆ *The vehicle must be raised and readings made from below to enable the gauge to read while turning injection pump drive sprocket.*
- ◆ *A second mechanic is required to observe the flywheel and clutch bell housing markings when checking the commencement of injection while the crankshaft is turned back and forth.*

**A**

- Turn injection pump drive sprocket against engine direction of rotation - direction of arrow A- using counter-hold 3036 until the gauge needle does not move any more.
- Set gauge to "0".
- Turn injection pump drive sprocket in engine direction of rotation - direction of arrow B- using counter-hold 3036 until the gauge reads: 1.00 " 0.02 mm lift (commencement of injection).
- Hold injection pump drive sprocket in this position with counter-hold 3036 and pre-tighten to 50 Nm.

**Note:**

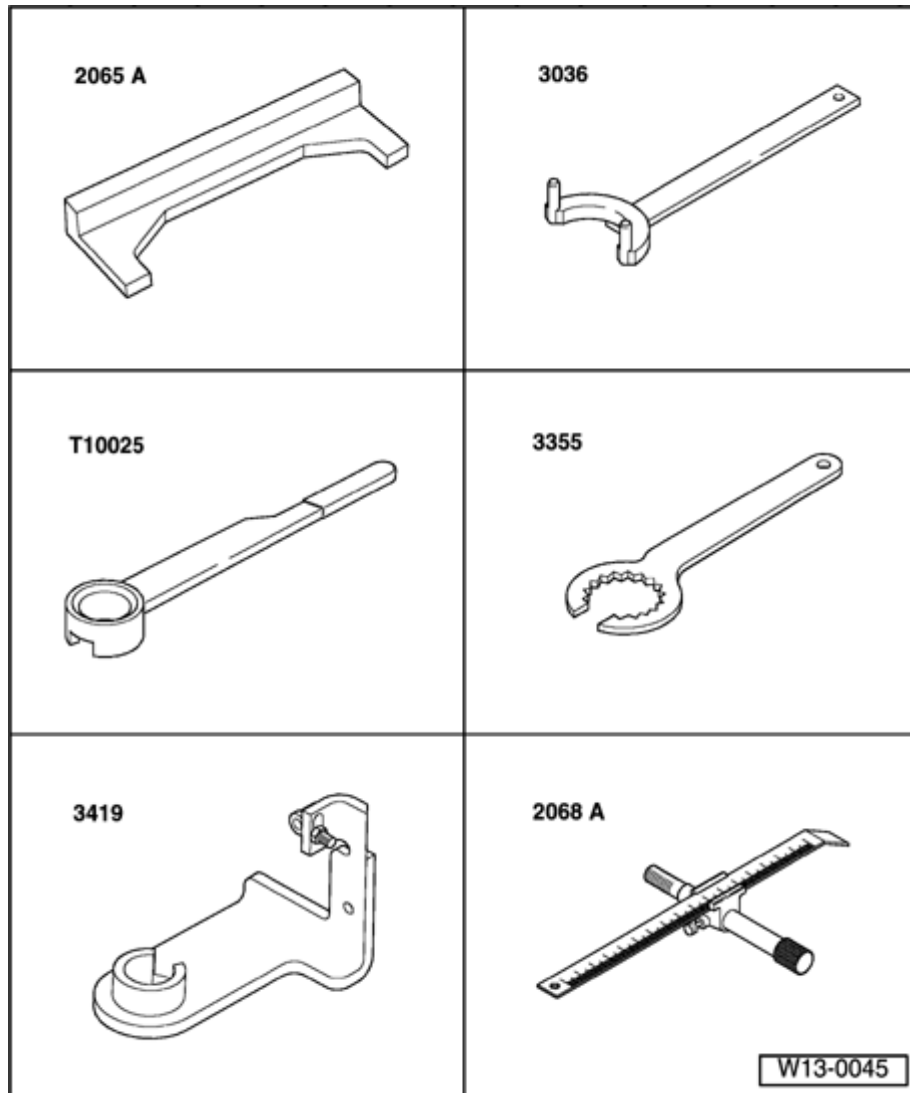
*The commencement of injection must be checked again by turning crankshaft back via vibration damper to gauge reading "0" and forward to TDC. The reading will deviate due to toothed belt step.*

- The commencement of injection is to be reset a second time taking deviation into account.

**Example:**

-	First value	1.00 mm
	Checked value	0.93 mm
=	Deviation	0.07 mm
	Value for second adjustment	1.07 mm

- Hold injection pump drive sprocket with counter-hold 3036, after second adjustment and tighten to 100 Nm.
- Install cylinder head cover and toothed belt guard.
- Install power steering vane pump V-belt and adjust ⇒ [Page 13-5](#) , item 29 .
- Install generator V-belt and adjust ⇒ [Page 13-25](#) .
- Install insulation tray.
- Install radiator with lock carrier.



## Camshaft toothed belt, removing, installing and tensioning (02.95 ➤)

Vehicles 02.95 ➤ with tensioning roller for tensioning toothed belt

### Special tools and equipment required

- ◆ 2065 A Setting bar
- ◆ 3036 Retainer
- ◆ T10025 Counter-hold
- ◆ 3355 Ring wrench

With engine removed:

- ◆ 3419 Counter-hold
- ◆ 2068 A TDC setting device



### Special tools and equipment required

- ◆ VAG 1331 Torque wrench (5 - 50 Nm)
- ◆ VAG 1332 Torque wrench (40 - 200 Nm)
- ◆ VAG 1601 Torque wrench (150 - 800 Nm)
- ◆ Feeler gauge

### Removing

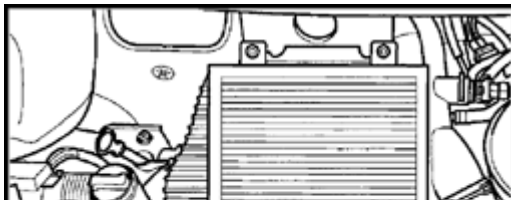
- Remove ribbed belt ⇒ [Page 13-27](#) .
- Removing radiator grille:

⇒ [Repair Manual , Body Exterior, Repair Group 66; Servicing radiator grille](#)

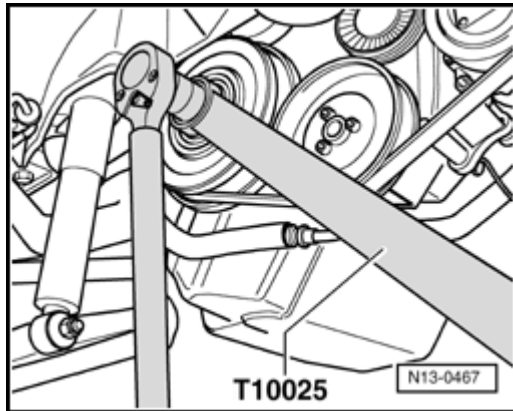
### Engine code ACV, AUF

- Remove charged air cooler bracket -1-.

**Continued for all vehicles**



- Remove left and right-hand securing bolts -2-.
- Fold lock carrier and radiator out forward -arrow-.
- Remove both toothed belt guards and cylinder head cover.



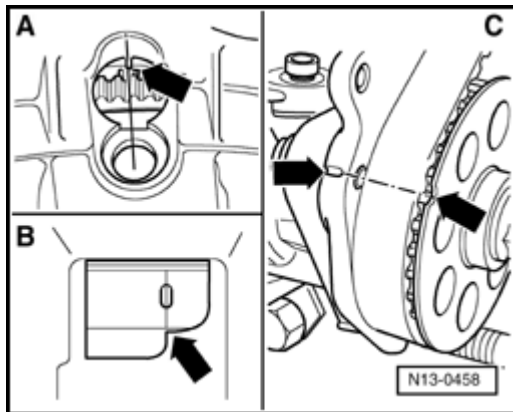
- A**
- Insert counter-hold T10025 and loosen vibration damper and toothed belt pulley by loosening center bolt.

**Note:**

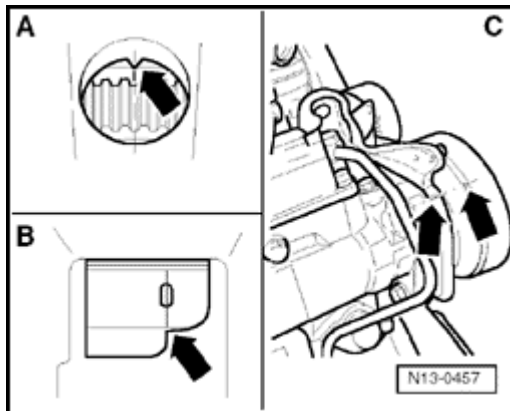
*With engine removed, the counter-hold 3419 can also be used.*

- Turn crankshaft to TDC No. 1 cylinder -arrow-.

Engine installed:



- A**
- Engine code AAB, AJT, ACV, AUF
- Marks -arrows- on injection pump sprocket and console -C- and on flywheel and clutch bell housing -A- or drive plate and clutch bell housing -B-must align.

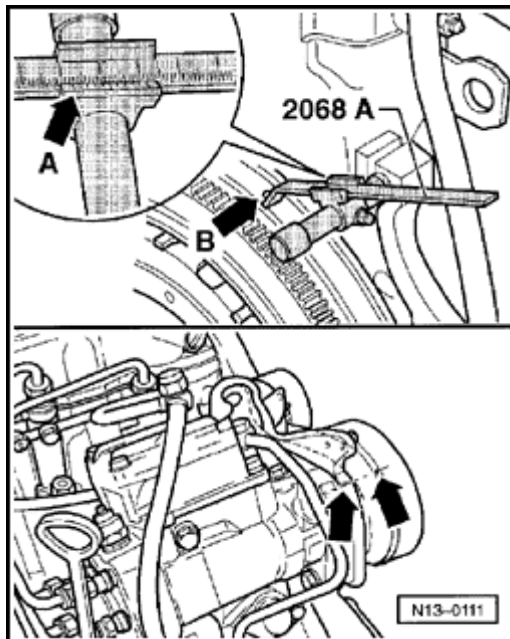


Engine code ACV syncro, AHY, AXG

- Marks -arrows- on injection pump sprocket and console -C- and on flywheel and clutch bell housing -A- or drive plate and clutch bell housing -B- must align.

**Note:**

*This condition only occurs every 2nd TDC position.*



Engine removed

- Set TDC setting device 2068 A to 82 mm -arrow A- the left-hand mark on the scale is the reference point.
- Install setting device as shown. Turn crankshaft until TDC mark on flywheel and drive plate aligns with edge of setting device -arrow B- and marks on injection pump sprocket and console also align.

**Note:**

*This condition only occurs every 2nd TDC position.*

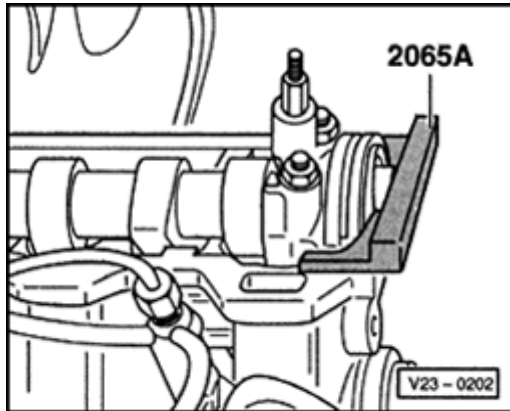
- Remove injection pump toothed belt:



- ◆ Engine code AAB ⇒ [Page 13-54](#) .
- ◆ Engine code ACV ⇒ [Page 13-61](#) .
- Remove vibration damper center bolt.
- Loosen the 4 x M8 crankshaft vibration damper and toothed belt pulley securing bolts and remove 2 opposing bolts.
- Loosen the 2 remaining bolts until the vibration damper can be released from crankshaft toothed belt pulley by a light hammer blow on the bolt heads.
- Remove vibration damper.
- Remove lower toothed belt guard.
- Mark direction of rotation of toothed belt.
- Relieve toothed belt tension with ring wrench 3355.
- Take off toothed belt.

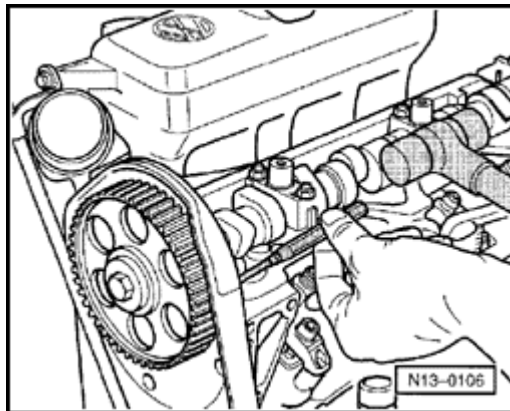
### **Installing, tensioning**

- Remove injection pump drive sprocket.
- Check whether TDC mark on flywheel and reference marks are aligned.



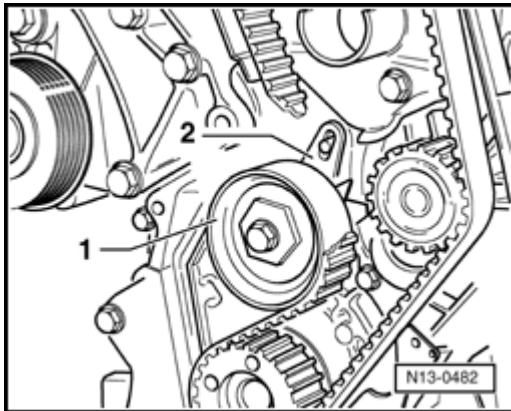
A

- Lock camshaft with setting bar 2065 A.
- Center setting bar as follows:
- Turn camshaft so that one end of setting bar contacts the cylinder head. Using feeler gauge, establish the gap at the other end of the setting bar. Place a feeler gauge corresponding to half the gap between setting bar and cylinder head. Turn camshaft until the setting bar contacts the feeler gauge. Place a 2nd feeler gauge, of same thickness, at the other end between setting bar and cylinder head.



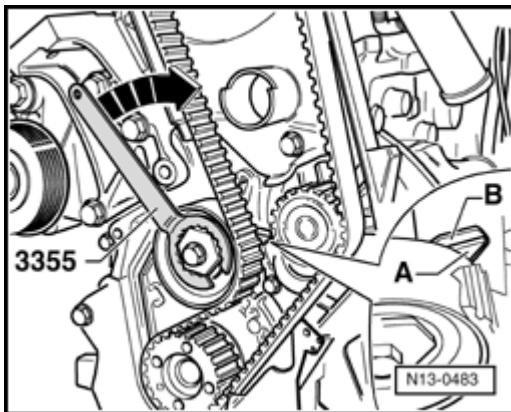
A

- Loosen camshaft sprocket securing bolt a  $1/2$  turn. Release camshaft sprocket from camshaft tapered by tapping with a hammer (using a drift through rear toothed belt guard opening).



A

- Install tensioning roller -1- so that the retaining lug locates on the retaining pin -2- on the lower part of the toothed belt guard.
- Install toothed belt for camshaft drive. For used belts note direction of rotation.
- Tighten tensioning roller securing bolt hand tight.



A

- To tighten the toothed belt turn the tensioning roller clockwise with ring wrench 3355 -direction of arrow-, until the right edge of indicator -A- aligns with right edge of indicator -B-.

**Note:**

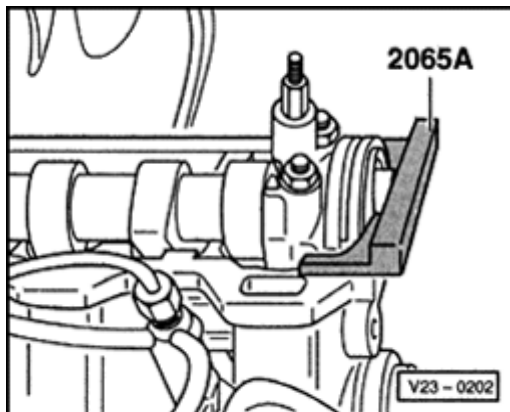
- ◆ *The right edge of indicator -A- must not be rotated past the right edge of indicator -B-, otherwise the tensioning roller can be damaged.*
- ◆ *If it does happen that it is turned too far, the tensioning roller must be fully released and then retightened. You must not turn the eccentric back by purely the amount it has been turned too far.*
- Tighten tensioning roller securing bolt to 20 Nm.



- Check if crankshaft is still on TDC No. 1 cylinder, correct if necessary.
- Tighten camshaft sprocket securing bolt using counter-hold 3036.
- Observe steel type marking on bolt head:

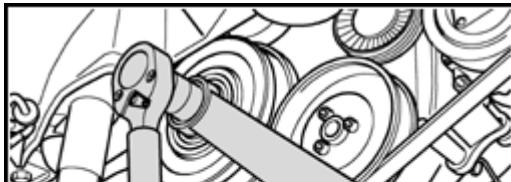
8.8 = 85 Nm

10.9 = 100 Nm



A

- Remove setting bar 2065A from camshaft.
- Install lower toothed belt guard.
- Install vibration damper with new center bolt.



A

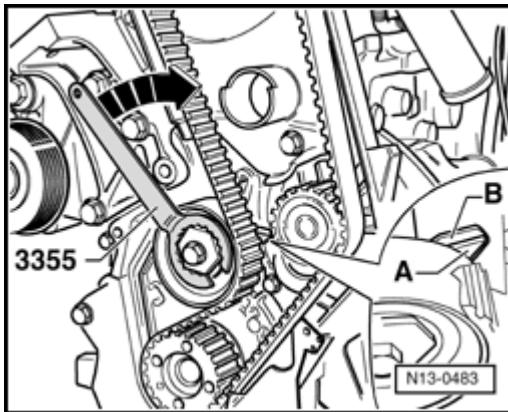
- Insert counter-hold T10025 and tighten vibration damper and crankshaft toothed belt sprocket center bolt to 160 Nm and turn 180° (1/2 turn) further (turning further can be completed in several stages).

**Note:**

*With engine removed the counter-hold 3419 can also be used.*

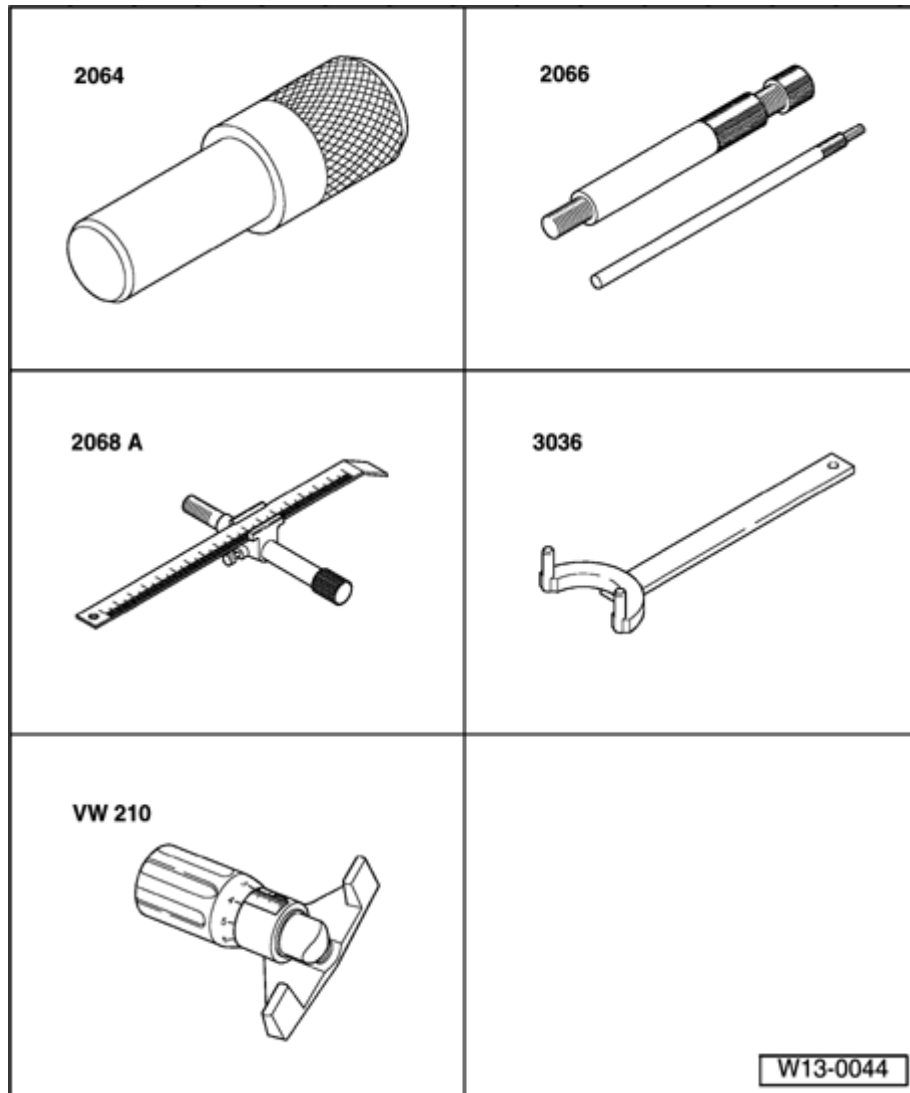


- Tighten the 4xM8 crankshaft vibration damper and toothed belt pulley securing bolts to 20 Nm and turn 90° (1/4 turn) further (turning further can be completed in several stages).
- Turn crankshaft two rotations in engine direction of rotation until crankshaft is set to TDC No. 1 cylinder again.



A

- Again check the position of the tensioning roller indicator. If the right edges of indicator -A- and -B- do not align, the tensioning procedure must be repeated.
- Install injection pump toothed belt:
  - ◆ Engine code AAB ⇒ [Page 13-54](#) .
  - ◆ Engine code ACV ⇒ [Page 13-61](#) .
- Install both toothed belt guards and cylinder head cover.
- Install radiator with lock carrier.
- Install ribbed belt ⇒ [Page 13-27](#) .
- Install insulation tray.



## Injection pump toothed belt, removing and installing (engine code AAB)

### Special tools and equipment required

- ◆ 2064 Pin
- ◆ 2066 Adapter for dial indicator
- ◆ 2068 A TDC setting device
- ◆ 3036 Retainer
- ◆ VW 210 Checking appliance for V-belt and toothed belt



### Special tools and equipment required

- ◆ VAG 1331 Torque wrench (5 - 50 Nm)
- ◆ VAG 1332 Torque wrench (40 - 200 Nm)
- ◆ Dial indicator (measuring range 0 - 3 mm)

### Removing

- Remove insulation tray:

⇒ [Repair Manual , Body Exterior, Repair Group 50; Removing insulation tray](#)

### Vehicles 09.94 ➤

- Remove radiator grille:

⇒ [Repair Manual , Body Exterior; Repair Group 66; Servicing radiator grille](#)

**Continued for all vehicles**





- Remove left and right-hand securing bolts -1-.

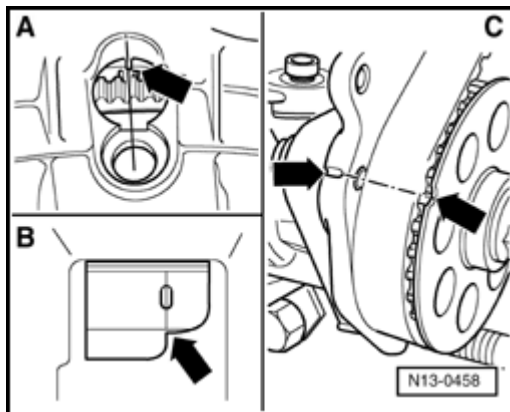
**Note:**

*Vehicles 09.94 ➤ there is 1 securing bolt on each left and right-hand side of lock carrier.*

- Fold lock carrier with radiator out forward -arrow-.

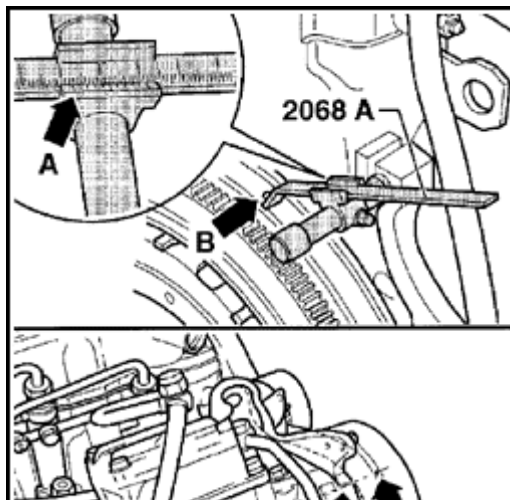


- Remove injection pump toothed belt guard.
- Turn crankshaft in engine direction of rotation to TDC No. 1 cylinder:



#### A Engine installed

- Marks -arrows- on injection pump sprocket and console -C- and on flywheel and clutch bell housing -A- or drive plate and clutch bell housing -B- must align.

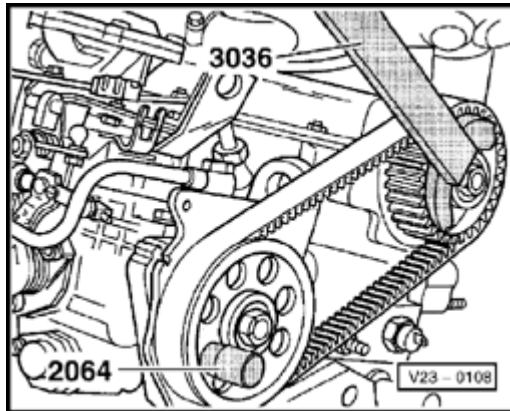


#### A Engine removed

- Set TDC setting device 2068 A to 82 mm -arrow A-, the left scale mark is the reference point.
- Install setting device as shown. Turn crankshaft until TDC mark on flywheel and drive plate aligns with edge of setting device -arrow B- and marks on injection pump sprocket and console also align.

#### **Note:**

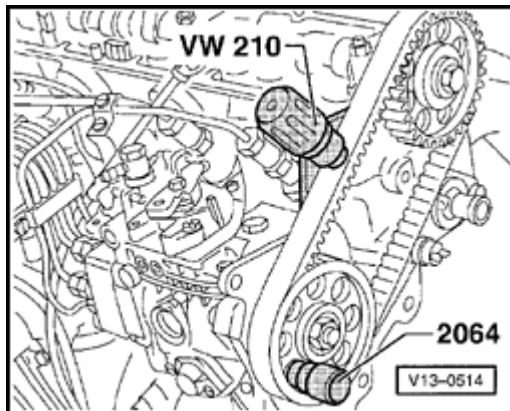
*This condition only occurs every 2nd TDC position.*

**A**

- Lock injection pump sprocket with pin 2064.
- Mark direction of rotation of toothed belt.
- Hold injection pump drive sprocket with counter-hold 3036. Remove securing bolt and take off drive sprocket with toothed belt.

### Installing, tensioning

- Check whether TDC mark on flywheel and reference mark are aligned.
- Install injection pump drive toothed belt with injection pump drive sprocket. Tighten securing bolt until the drive sprocket can still just be turned by hand. For used toothed belts, note direction of rotation.

**A**

- Check toothed belt tension with test unit VW 210.
- Scale value: 12 - 13



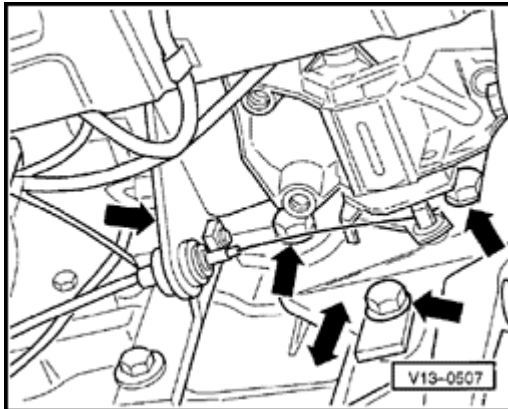
If scale value is not achieved:



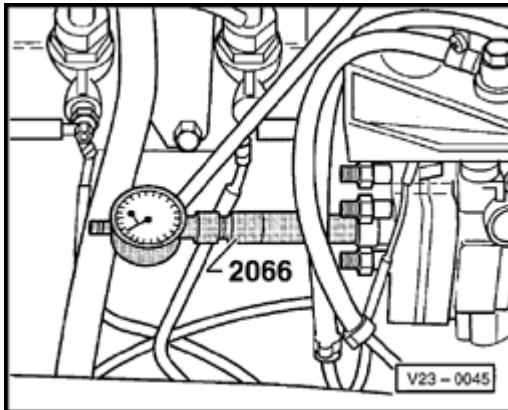
- Adjust toothed belt tension to scale value after loosening securing bolts -arrows- and moving console (with injection pump).

If scale value is achieved:

- Remove pin 2064 from injection pump sprocket.

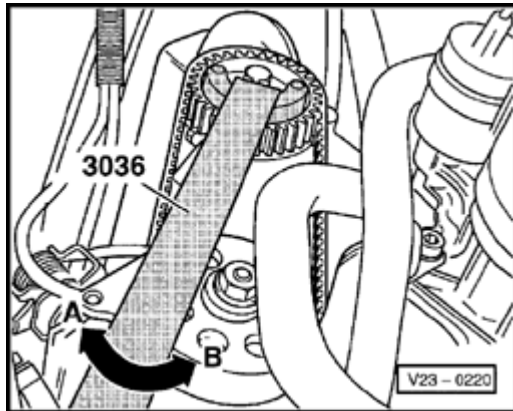


- Install adapter for gauge 2066 and gauge (measuring range 0 to 3 mm) with 2.0 mm preload in place of sealing plug.
- Check that crankshaft is still on TDC No. 1 cylinder and adjust commencement of injection as follows:



**Note:**

- ◆ *The vehicle must be raised and readings made from below to enable the gauge to read while turning injection pump drive sprocket.*
- ◆ *A second mechanic is required to observe the flywheel and clutch bell housing markings when checking the commencement of injection while turning crankshaft back and forth.*

**A**

- Turn injection pump drive sprocket against engine direction of rotation - direction of arrow A- using counter-hold 3036 until the gauge needle does not move any more.
- Set gauge to "0".
- Turn injection pump drive sprocket in engine direction of rotation - direction of -arrow B- using counter-hold 3036 until the gauge reads:
- Engine code AAB
- $1.00 \pm 0.02$  mm lift (commencement of injection).
- Engine code AJA
- $0.90 \pm 0.02$  mm lift (commencement of injection).
- Hold injection pump drive sprocket in this position with counter-hold 3036 and pre-tighten to 50 Nm.

**Note:**

*The commencement of injection must be checked again by turning crankshaft back via vibration damper to gauge reading "0" and forward to TDC. The value will deviate due to toothed belt step.*

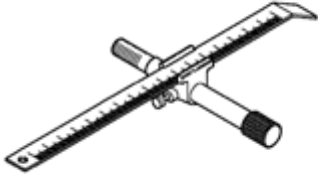
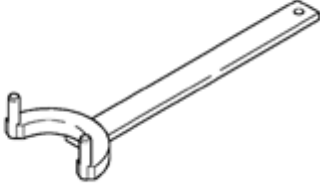
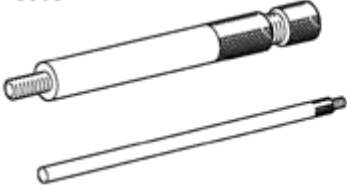


- The commencement of injection is to be reset a second time taking deviation into account.

**Example:**

-	First value	1.00 mm
	Checked value	0.93 mm
=	Deviation	0.07 mm
	Value for second adjustment	1.07 mm

- Hold injection pump drive sprocket, after second adjustment with counter-hold 3036 and tighten to 100 Nm.
- Install toothed belt guard for injection pump.
- Install radiator with lock carrier.
- Install insulation tray.



<p>2068 A</p> 	<p>3036</p> 
<p>3313</p> 	<p>V.A.G 1331</p> 
<p>V.A.G 1332</p> 	<p>W13-0046</p>

## Injection pump toothed belt, removing and installing (engine code ACV)

### Special tools and equipment required

- ◆ 2068 A TDC setting device
- ◆ 3036 Retainer
- ◆ 3313 Adapter for dial indicator
- ◆ VAG 1331 Torque wrench (5 - 50 Nm)
- ◆ VAG 1332 Torque wrench (40 - 200 Nm)
- ◆ Dial indicator (measuring range 0 - 3 mm)



## Removing

- Removing insulation tray:

⇒ [\*Repair Manual , Body Exterior, Repair Group 50; Removing insulation tray\*](#)

- Remove radiator grille:

⇒ [\*Repair Manual , Body Exterior, Repair Group 50; Servicing radiator grille\*](#)

## Engine code ACV, AUF



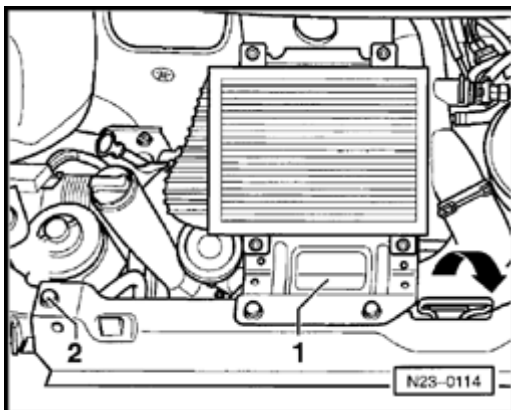
- Remove charge air cooler -1-.

## Continued for all vehicles

- Remove left and right-hand securing bolts -2-.
- Fold lock carrier with radiator out forward -arrow-.

## Engine code AHY, AXG

- Disconnect charge air cooler or intake connecting line at intake.



- Remove coolant line securing bolt from starter.

**Continued for all vehicles**

- Remove injection pump toothed belt guard.
- Turn crankshaft in engine direction of rotation to TDC No. 1 cylinder:

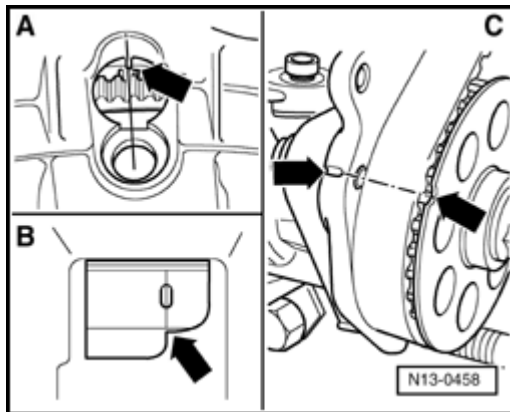


Engine installed:



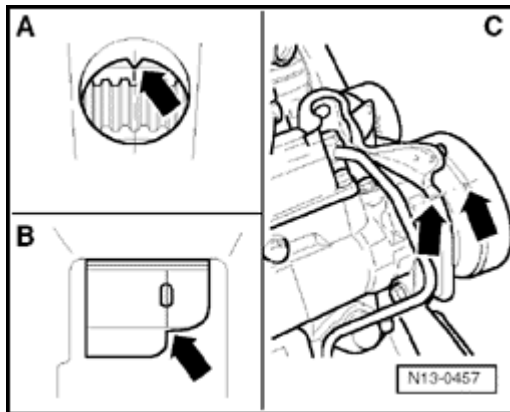
Engine code ACV

- Marks -arrows- on injection pump sprocket and console -C- and on flywheel and clutch bell housing -A- or drive plate and clutch bell housing -B- must align.



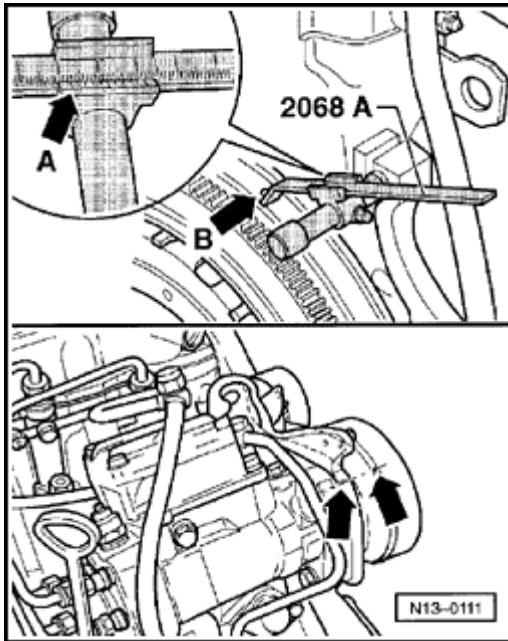
Engine code ACV syncro

- Marks -arrows- on injection pump sprocket and console -C- and on flywheel and clutch bell housing -A- or drive plate and clutch bell housing -B- must align.



**Note:**

*This condition only occurs every 2nd TDC position.*



Engine removed

- Set TDC setting device 2068 A to 82 mm -arrow A-, the left scale mark is the reference point.
- Install setting device as shown. Turn crankshaft until TDC mark on flywheel and drive plate aligns with edge of setting device -arrow B- and marks on injection pump sprocket and console also align.

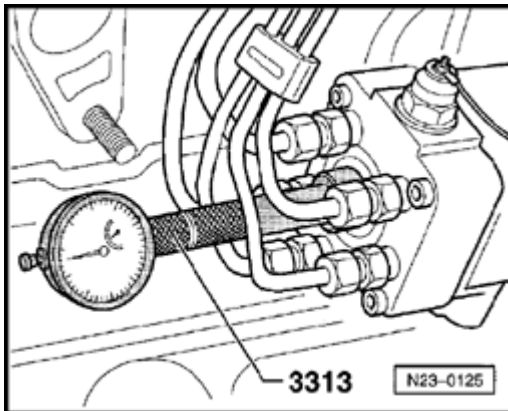
**Note:**

*This condition only occurs every 2nd TDC position.*

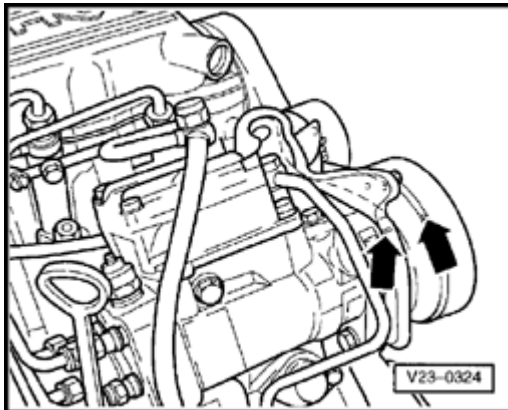
- Mark direction of rotation of toothed belt.
- Hold injection pump drive sprocket with counter-hold 3036. Remove securing bolt and take off drive sprocket with toothed belt.
- Remove toothed belt tensioning roller.



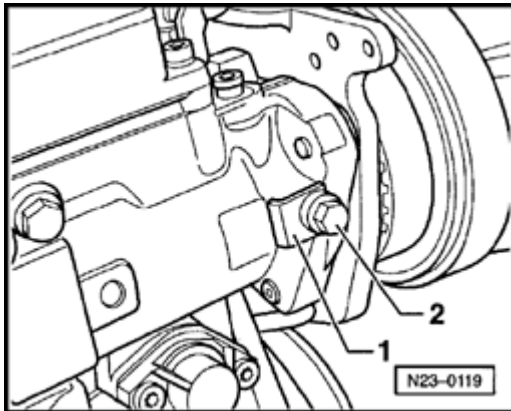
### Installing, tensioning



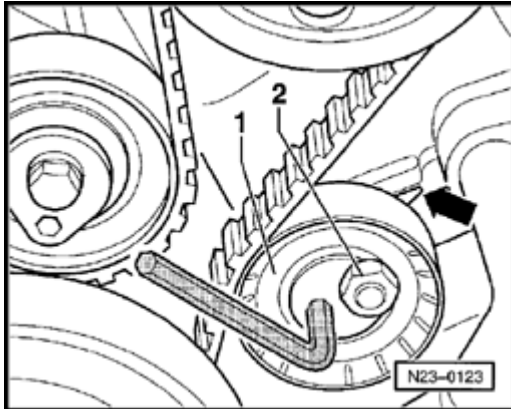
- Install adapter 3313 instead of sealing plug.
- Insert dial indicator (measuring range 0 - 3.0 mm) into adapter with approx. 2.0 mm pretension.



- Check if markings on injection pump sprocket and injection pump align -arrow-.

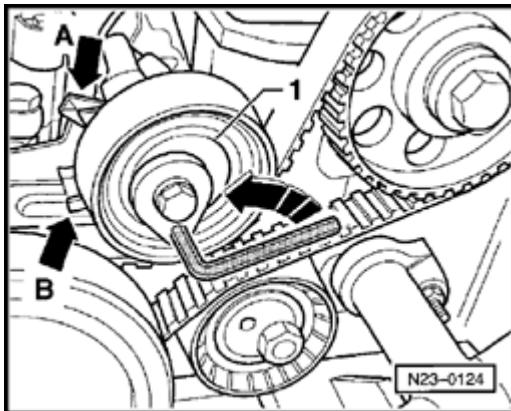
**A**

- Remove blocking bolt -2- on injection pump.
- Remove intermediate plate -1-.
- Set dial indicator to "0".
- To check that the injection pump high pressure pistons are at BDC turn injection pump sprocket slowly with counter hold 3036 against engine direction of rotation (clockwise). The dial indicator must remain on "0"; otherwise, set dial indicator to "0" after achieving BDC.
- Turn injection pump sprocket with counter hold 3036 slowly in engine direction of rotation (counterclockwise) until the dial indicator displays 0.55 mm lift.
- Tighten the blocking bolt to 30 Nm.
- Check whether TDC mark on flywheel and reference mark are aligned.
- Place tooth belt on injection pump sprocket.
- Observe direction of rotation with used toothed belt.
- Install injection pump sprocket into toothed belt and secure sprocket to the camshaft so it can still turn.



A

- Checking idler roller installation position:
- Turn idler roller until the indicator aligns with the cylinder head flange contour -arrow-.
- Tighten securing nut -2- to 20 Nm.



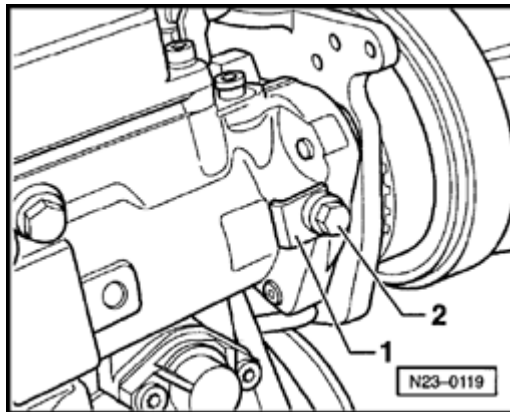
A

- Install tensioning roller -1- so that the tensioning roller cap sits within the cut-outs on the console -arrow B-.
- Tighten securing bolt.
- To tighten toothed belt turn tensioning roller counterclockwise until both indicators align -arrow A-.
- Tighten securing bolt to 15 Nm.
- Tighten injection pump drive pulley securing nut to 160 Nm. Use counter hold 3036.



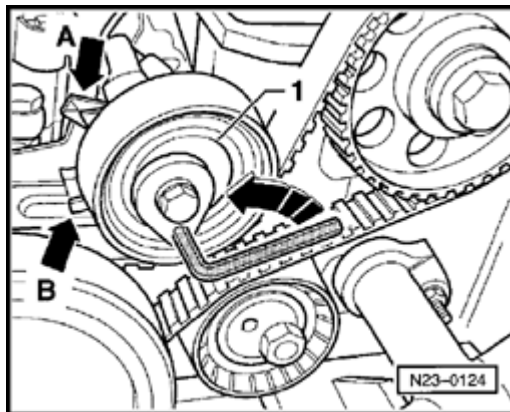
**Note:**

*Make sure when tightening the securing bolt that no torque is transferred to the blocked commencement of injection pump shaft.*



A

- Remove injection pump locking bolt -2-.
- Install intermediate plate -1- and tighten blocking bolt to 12 Nm.
- Remove dial indicator and install injection pump sealing plug.
- Turn crankshaft two rotations in engine direction of rotation until crankshaft is set to TDC No. 1 cylinder again.



A

- Check the position of the indicator -arrow A-. The indicators must align. If the indicators do not align but the front indicator is within the metal backing plate of the rear indicator, the setting is OK.

**Note:**

*If the front indicator is outside the metal backing plate of the rear indicator the tensioning procedure must be repeated.*

- Install toothed belt guard.



### Continued for all vehicles

- Dynamically check commencement of injection and adjust if necessary:

⇒ [Repair Manual , 2.4 Liter 5-Cyl. 2V Diesel Fuel Injection & Glow Plug, Engine Code\(s\): AAB, Repair Group 23; Servicing Diesel direct injection system; Dynamically checking commencement of injection and adjusting](#)

- Install radiator with lock carrier.
- Install insulation tray.