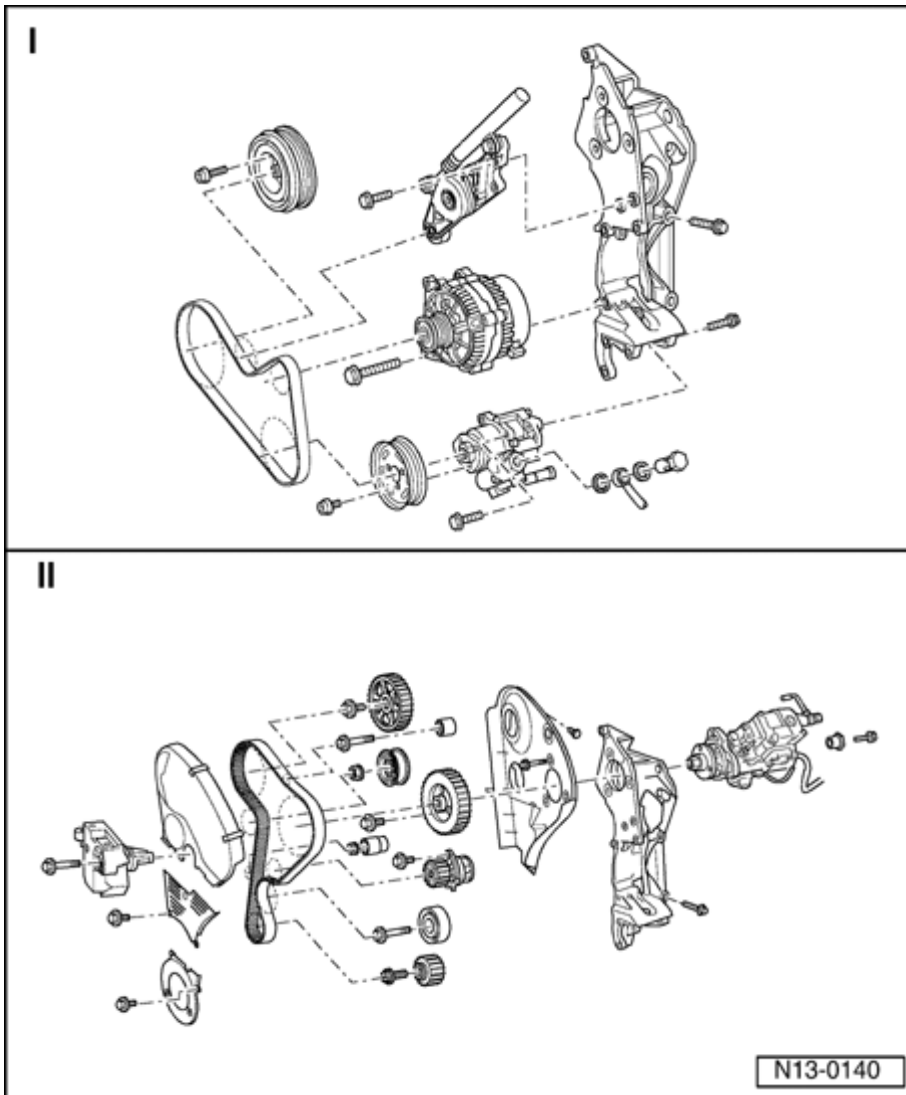
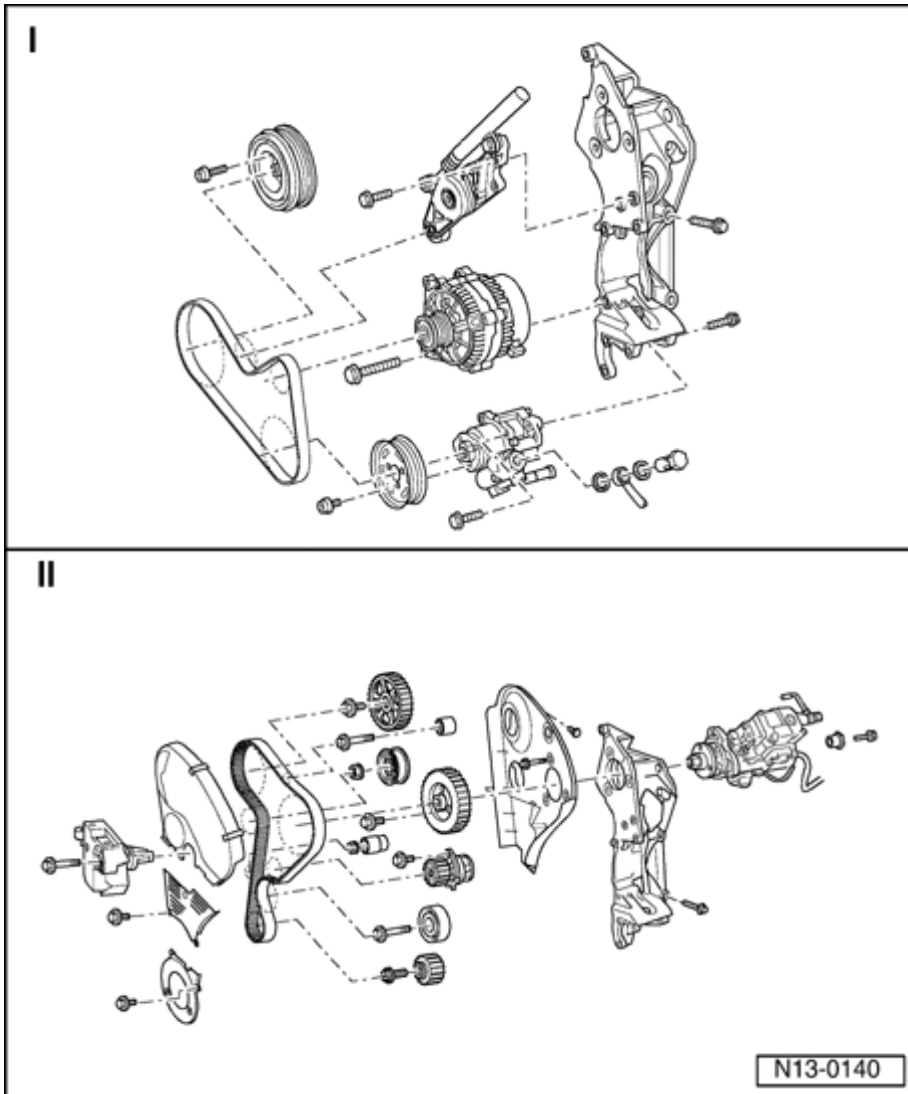


Engine, disassembling and assembling

Note:

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



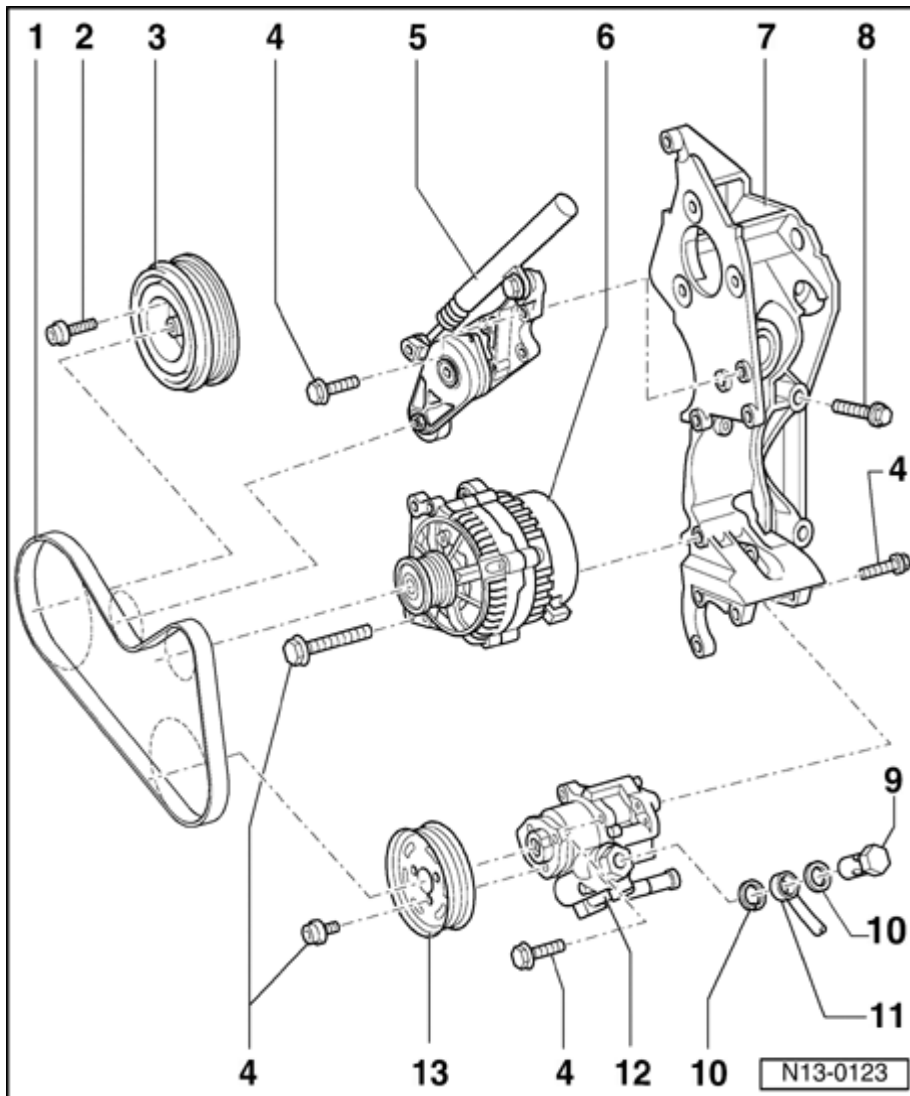


Fuel injectors, testing

⇒ [Repair Manual, 1.9 Liter 4-Cyl. 2V TDI Fuel Injection & Glow Plug, Engine Code\(s\): ALH, Repair Group 23](#)

I ⇒ [Page 13-3](#)

II ⇒ [Page 13-7](#)



Part I

1 - Ribbed belt

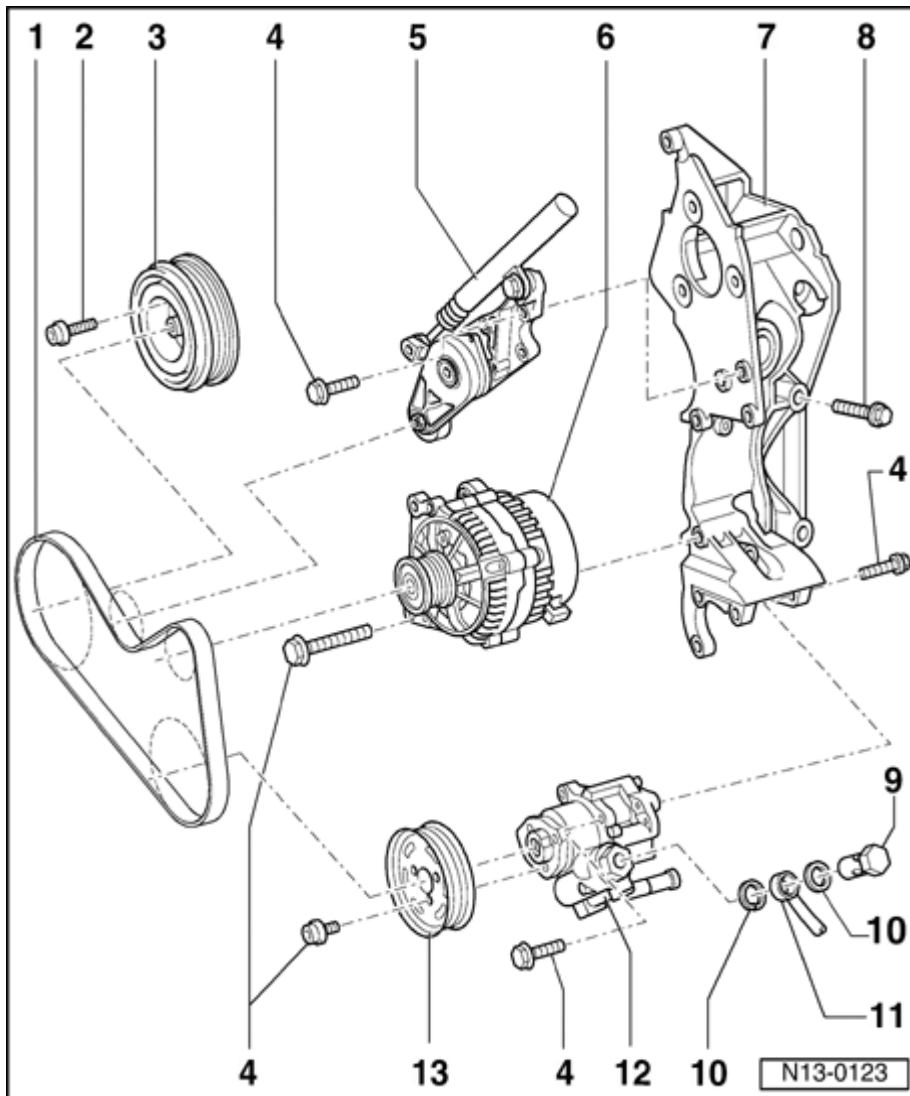
- ◆ Mark direction of engine rotation before removing
- ◆ Check for wear
- ◆ Do not kink
- ◆ Removing and installing ⇒ [Page 13-12](#)
- ◆ Vehicles with A/C with additional idler pulley, removing and installing ⇒ Fig. ⇒ [5](#)

2 - 10 Nm (7 ft lb) + $\frac{1}{4}$ turn (90°) further

- ◆ Always replace
- ◆ Torque angle can be measured with Hazet 6690 torque angle meter, or equivalent

3 - Belt pulley/vibration damper

- ◆ Can only be installed in one position; holes are offset



4 - 25 Nm (18 ft lb)

5 - Tensioning element

◆ For ribbed belt

- Turn with 16 mm wrench to slacken ribbed belt ⇒ [Page 13-12](#)

6 - Generator

7 - Assembly bracket

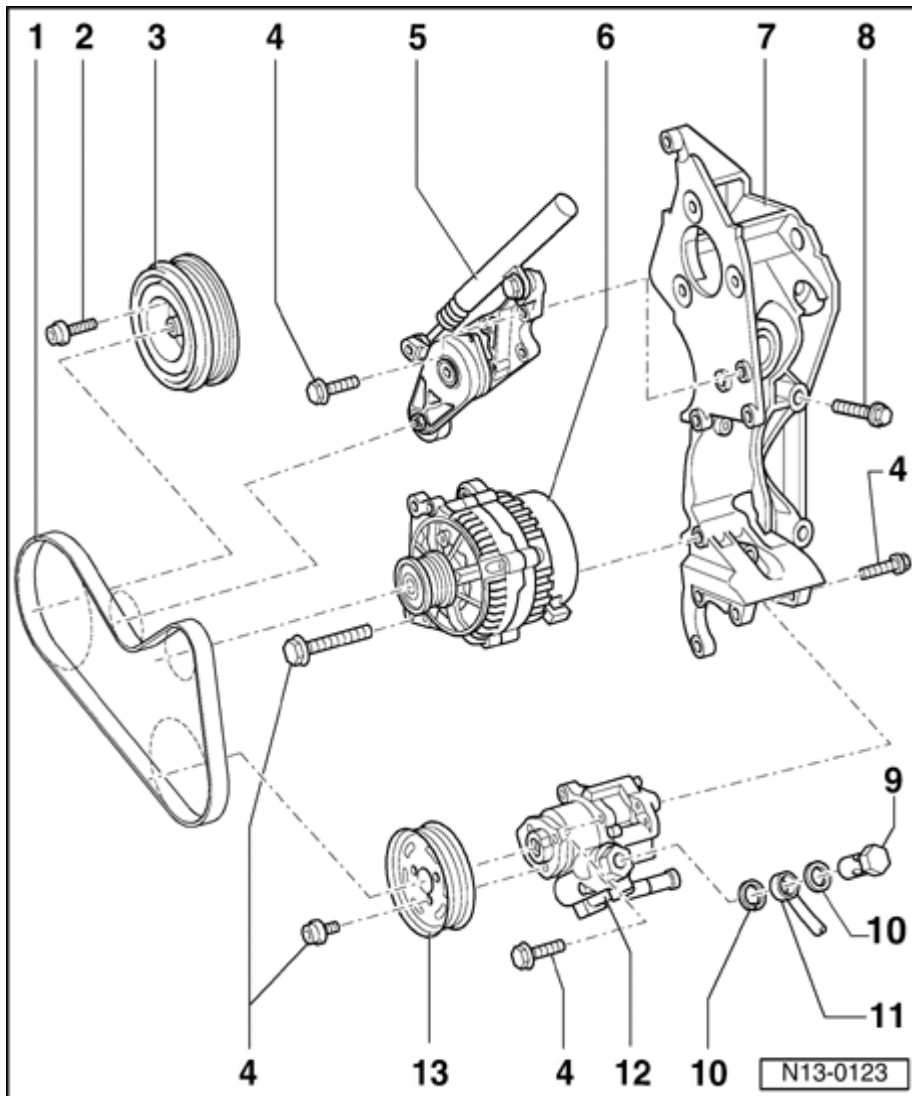
◆ For injection pump, generator and power steering pump

◆ For vehicles with A/C

◆ Assembly bracket for vehicles with A/C, removing and installing:

⇒ [Repair Manual, Heating & Air Conditioning, Repair Group 87](#)

8 - 45 Nm (33 ft lb)



9 - Banjo bolt

- ◆ 30 Nm (22 ft lb)

10 - Seal

- Always replace

11 - Pressure line

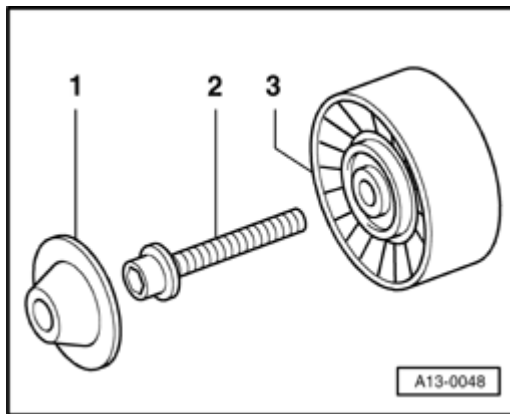
12 - Pump

- ◆ For power steering
- ◆ Removing and installing:

⇒ [Repair Manual, Suspension, Wheels, Steering, Repair Group 48](#)

13 - Pulley

- ◆ For power steering pump



A

Fig. 5 Idler pulley, removing and installing

Only for vehicles with A/C

Removing

- Remove sound dampener tray

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

- Remove ribbed belt.

⇒ [Page 13-12](#)

- Pry off cover -1- using screwdriver.
- Remove mounting bolt -2- and remove pulley -3-.

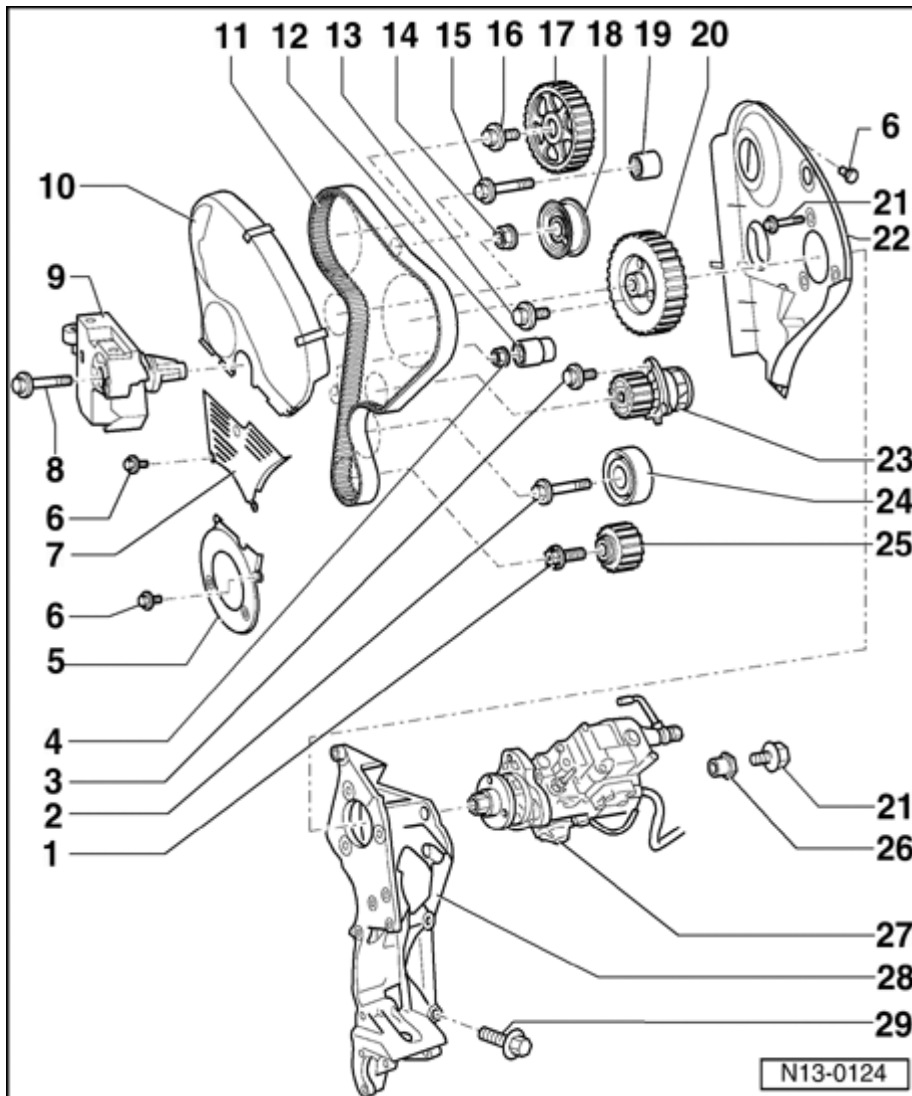
Installing

- Position pulley -3- and tighten mounting bolt -2-
 - Tightening torque 25 Nm (18 ft lb)
- Install ribbed belt.

⇒ [Page 13-12](#)

- Install sound dampener tray.

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



Part II

1 - 120 Nm (88 ft lb) + 1/4 turn (90°) further

- ◆ Always replace
- ◆ Threads and shoulder must be free of oil and grease
- ◆ To loosen and tighten, counter-hold with 3415
- ◆ Torque angle can be measured with Hazet 6690 torque angle meter, or equivalent

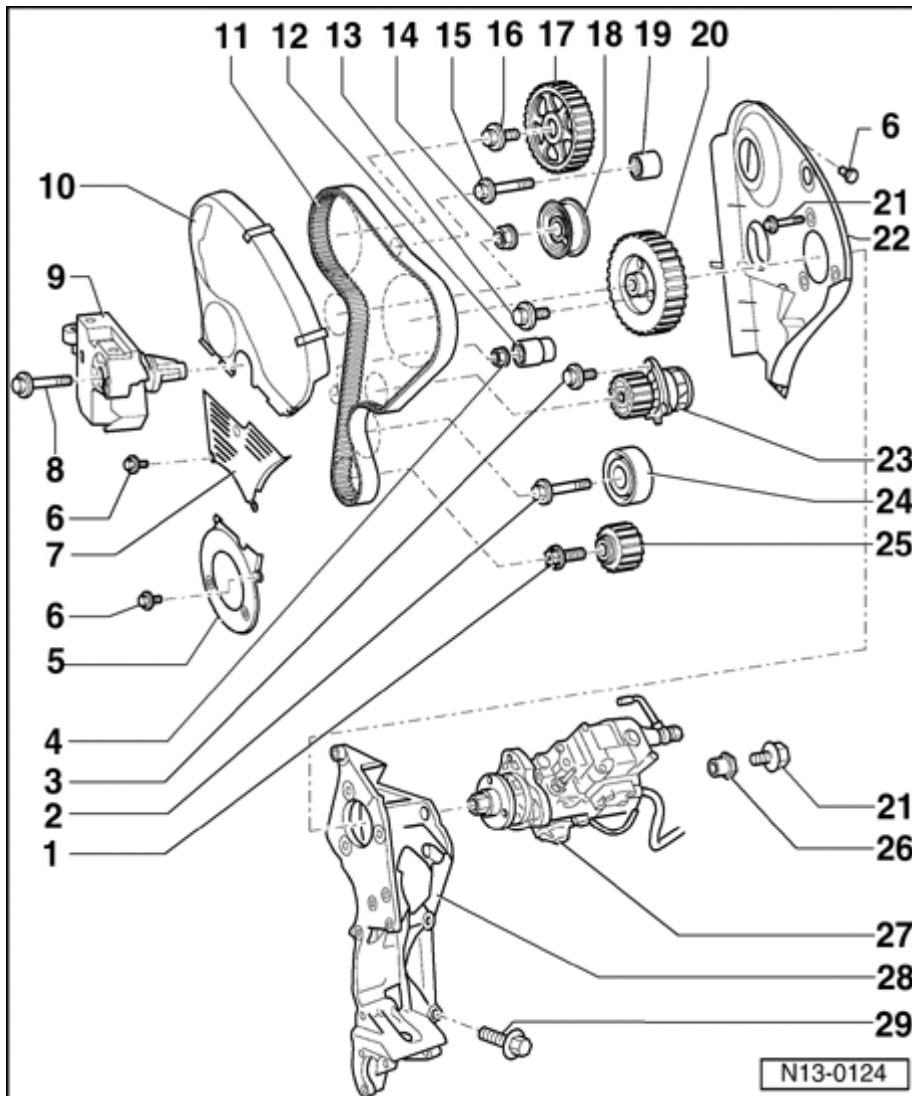
2 - 40 Nm (30 ft lb) + 1/4 turn (90°) further

- ◆ Always replace
- ◆ Torque angle can be measured with Hazet 6690 torque angle meter, or equivalent

3 - 15 Nm (11 ft lb)

4 - 22 Nm (16 ft lb)

5 - Timing belt guard, lower section



6 - 10 Nm (7 ft lb)

7 - Timing belt middle guard

8 - 45 Nm (33 ft lb)

9 - Right engine bracket

10 - Timing belt guard, upper section

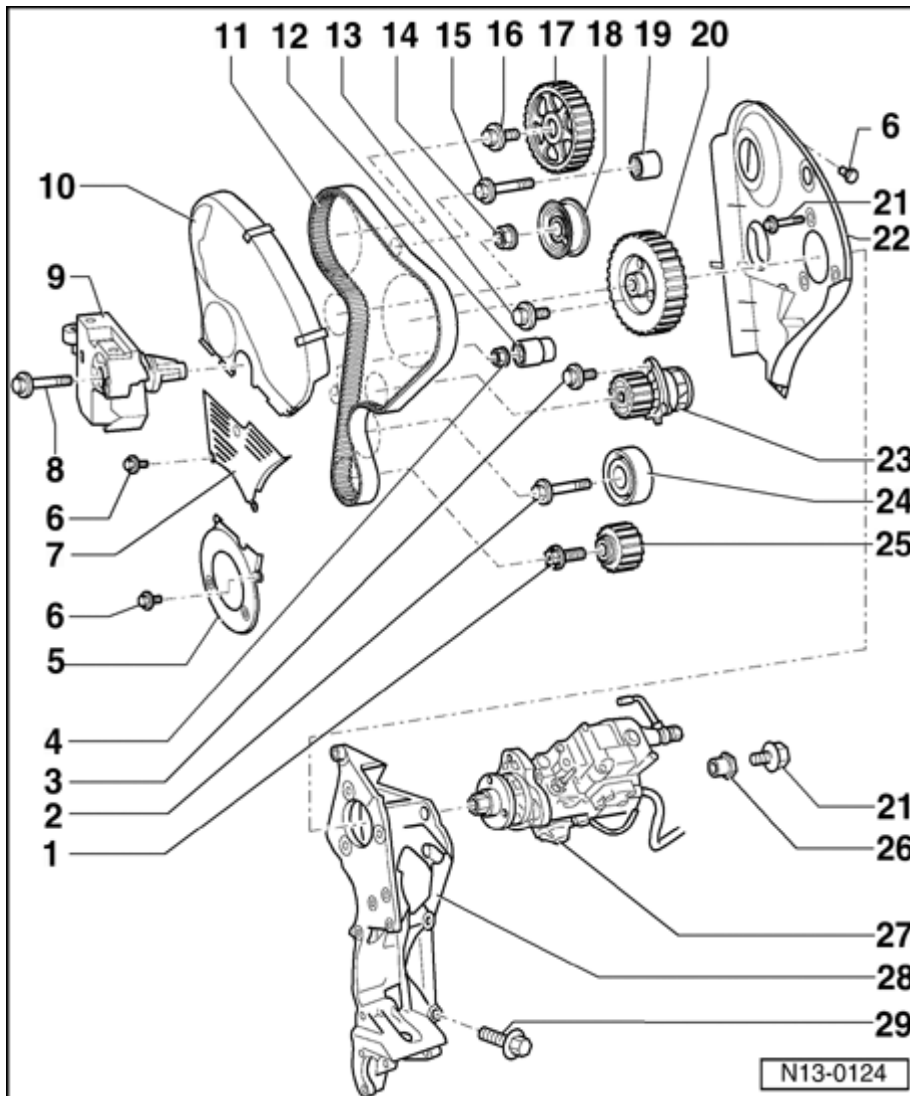
11 - Timing belt

- ◆ Mark engine direction of rotation before removing
- ◆ Check for wear
- ◆ Do not kink
- ◆ Removing, installing and tensioning ⇒ [Page 13-16](#)

12 - Idler pulley

13 - 20 Nm (15 ft lb) + $\frac{1}{4}$ turn (90°) further

- ◆ Always replace
- ◆ Torque angle can be measured with Hazet 6690 torque angle meter, or equivalent



14 - 20 Nm (15 ft lb)

15 - 20 Nm (15 ft lb)

16 - 45 Nm (33 ft lb)

◆ To loosen and tighten, counter-hold using 3036

17 - Camshaft sprocket

◆ Remove using T40001 two-arm puller ⇒ [Page 13-16](#)

18 - Tensioning roller

◆ Semi-automatic toothed belt tensioning roller, checking ⇒ [Page 13-29](#)

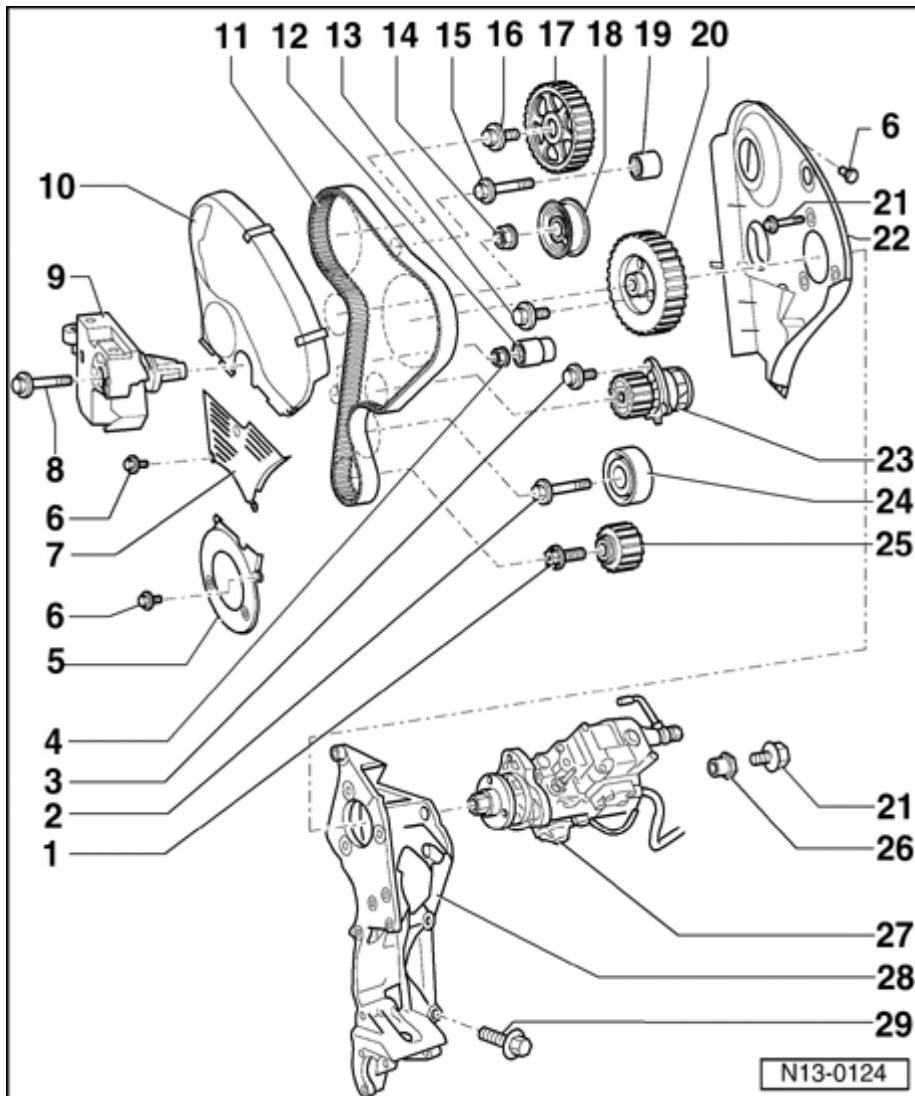
19 - Idler pulley

20 - Injection pump sprocket

◆ Two piece construction

21 - 30 Nm (22 ft lb)

22 - Timing belt guard, rear



23 - Coolant pump

- ◆ Check for easy movement.
- ◆ Replace when damaged or leaking.
- ◆ Removing and installing ⇒ [Page 19-22](#)

24 - Idler pulley

- ◆ Remove before removing coolant pump
- ◆ Removing and installing ⇒ [Page 19-22](#)

25 - Crankshaft timing belt sprocket

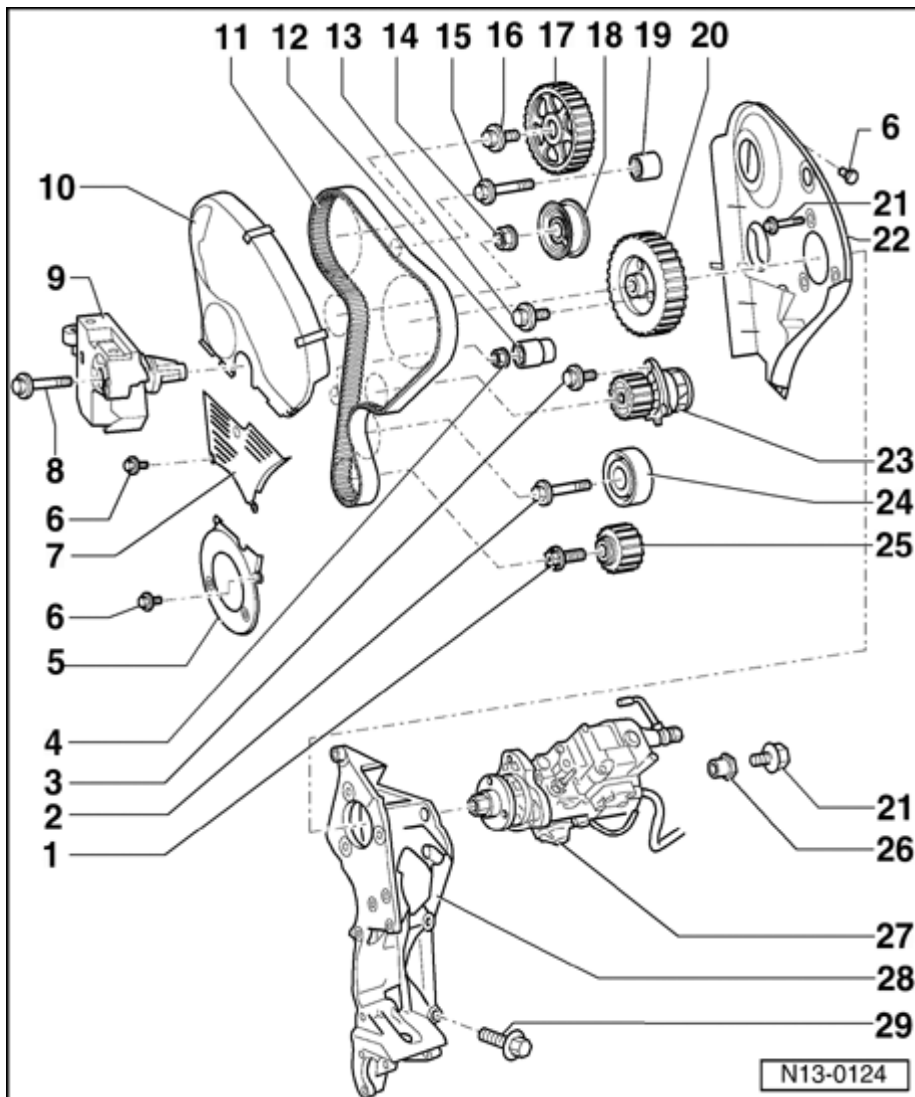
26 - Bushing

- ◆ with nut

27 - Injection pump

- ◆ Removing and installing:

⇒ [Repair Manual, 1.9 Liter 4-Cyl. 2V TDI Fuel Injection & Glow Plug, Engine Code\(s\): ALH, Repair Group 23](#)



28 - Assembly bracket

- ◆ For Diesel injection pump, generator and power steering pump.
- ◆ For vehicles with A/C
- ◆ Removing and installing:

⇒ [Repair Manual, Heating & Air Conditioning, Repair Group 87](#)

29 - 45 Nm (33 ft lb)

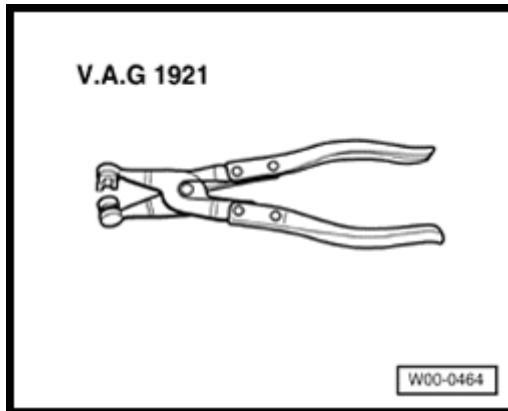


Ribbed belt, removing and installing

Special tools

A

- ◆ VAG 1921 Spring clip pliers

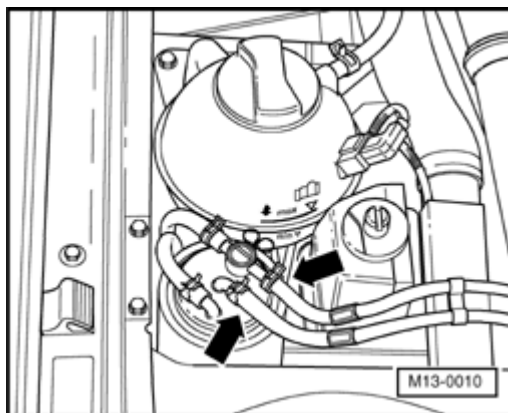


A

- Remove fuel supply and return lines from fuel filter (arrows).
- Seal fuel lines to prevent contamination of fuel system.
- Remove right headlight assembly:

⇒ [Repair Manual, Electrical Equipment, Repair Group 94](#)

- Remove pipe between charge air cooler and intake manifold ⇒ [Page 21-6](#) .





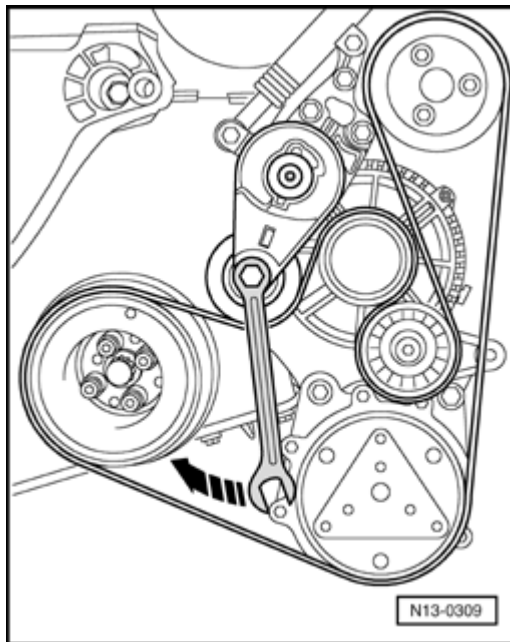
- Remove right sound damper cover.

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

- Mark direction of rotation on ribbed belt.

A

- Swing tensioning roller in direction of arrow using 16 mm box end wrench on tensioning lever.
- Remove or install ribbed belt.



Notes:

- ◆ *Vehicles without A/C: first remove ribbed belt from generator and install it there last.*
- ◆ *Vehicles with A/C: first remove V-belt from idler pulley and install it there last.*
- ◆ *Check that subassembly (generator, A/C compressor, power steering pump) is securely mounted before installing ribbed belt.*
- ◆ *Check that ribbed belt is installed with same direction of rotation and that belt sits correctly in pulleys.*
- Install pipe between charge air cooler and intake manifold ⇒ [Page 21-6](#) .



- Install fuel supply and return lines from fuel filter.

- Install right headlight assembly:

⇒ [Repair Manual, Electrical Equipment, Repair Group 94](#)

- Check headlight aim and correct, if necessary ;

⇒ [Repair Manual, Maintenance](#)

After installation is completed always check:

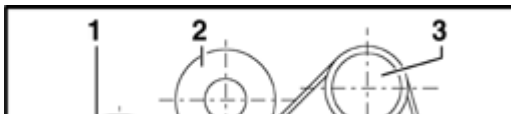
- Start engine and observe ribbed belt rotation.

- Install right sound damper cover.

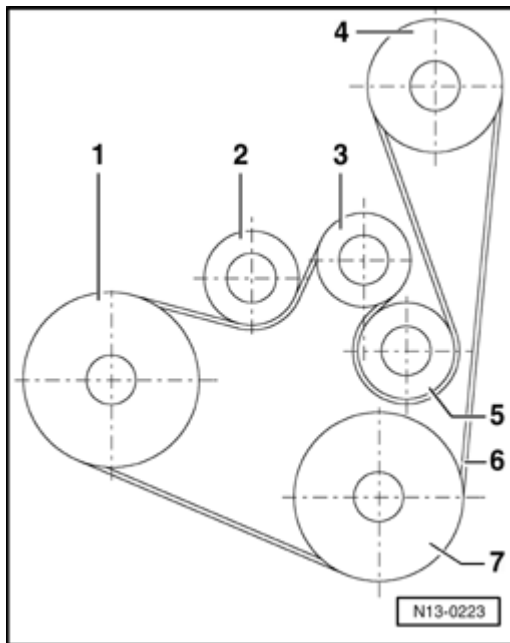
⇒ [Repair Manual, Body Exterior, Repair Group 50](#)

Ribbed belt, routing

Belt drive without A/C compressor

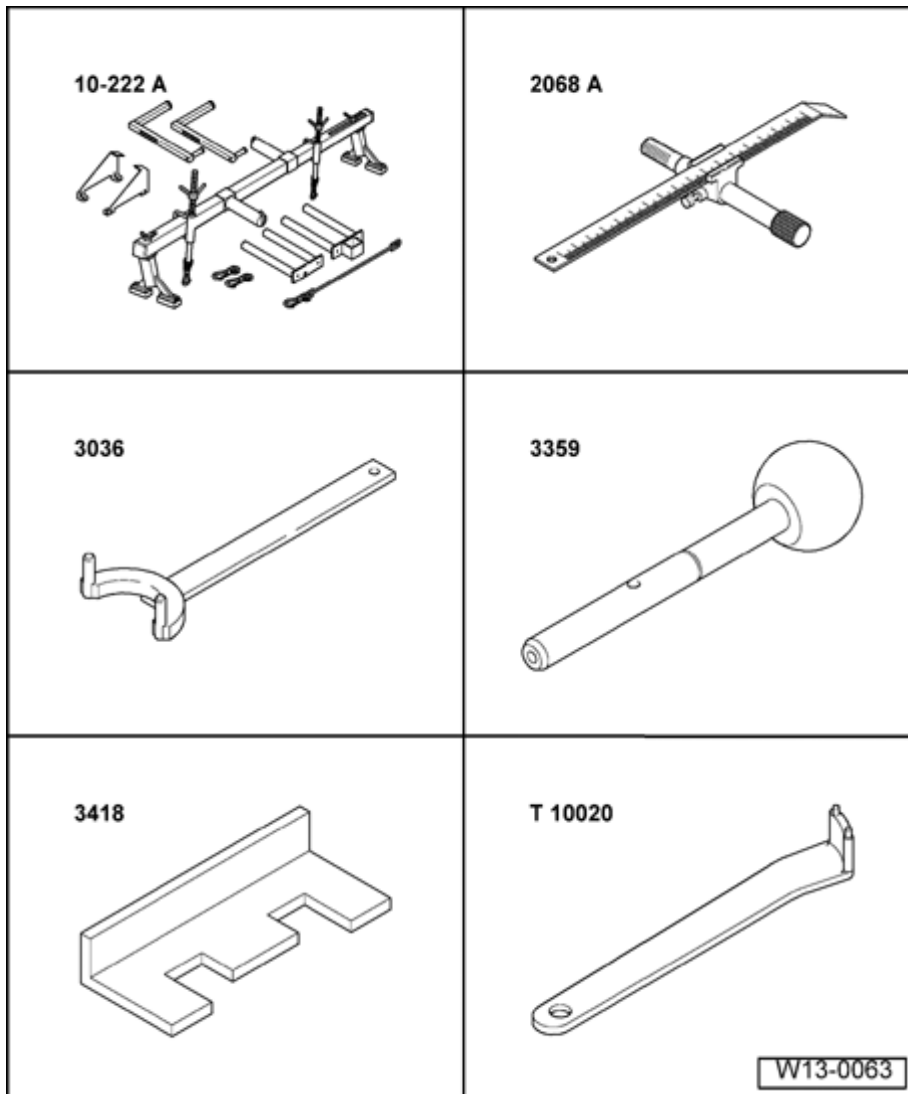


- 1 - Vibration damper/pulley
- 2 - Tensioner
- 3 - Pulley - generator
- 4 - Ribbed belt
- 5 - Pulley - power steering pump



➤ Belt drive with A/C compressor

- 1 - Vibration damper/pulley
- 2 - Tensioner
- 3 - Pulley - generator
- 4 - Pulley - power steering pump
- 5 - Idler pulley
- 6 - Ribbed belt
- 7 - Pulley - A/C compressor

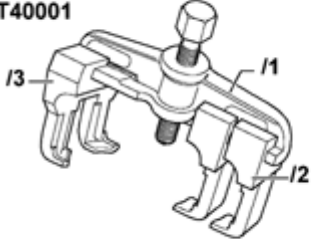




Toothed belt, removing, installing, tensioning

Special tools and equipment

- ◆ 10-222A Engine support bracket with 10-222A/1 legs
- ◆ 2068 A TDC tool
- ◆ 3036 Holding tool
- ◆ 3359 Pin
- ◆ 3418 Setting tool
- ◆ T10020 Two-hole nut wrench (vehicles with manual transmission)



<p>T40001</p> 	<p>V.A.G 1331</p> 
<p>V.A.G 1332</p> 	
	<p>W13-0064</p>

- ◆ T40001 Two-arm puller
- ◆ VAG 1331 Torque wrench 5 to 50 Nm (3.7 to 37 ft lb) (or equivalent)
- ◆ VAG 1332 Torque wrench 40 to 200 Nm (30 to 148 ft lb) (or equivalent)
- ◆ Feeler gauge (not shown)



Removing

- Remove upper engine cover.
- Remove ribbed belt.

⇒ [Page 13-12](#)

- Remove ribbed belt tensioner.
- Remove brake booster vacuum pump.
- Remove toothed belt guard - upper section.
- Remove valve cover.

Note:

The valve cover has an integrated, vulcanized gasket. If damaged or leaking replace the valve cover.

- Remove tube between charge air cooler and air intake pipe.

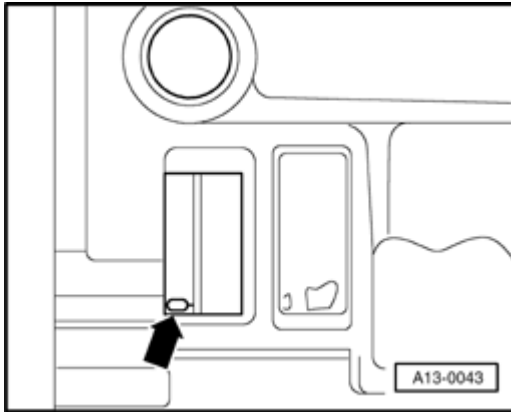
⇒ [Page 21-6](#)

With engine installed:



A

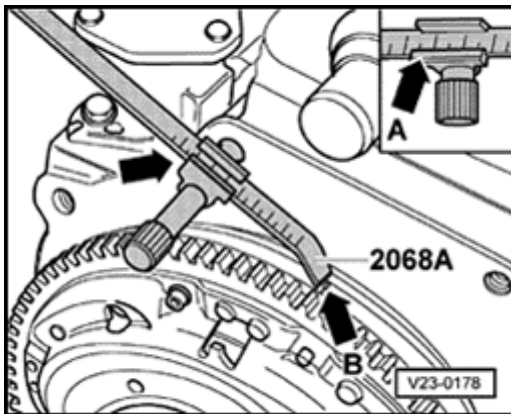
- Turn crankshaft to cylinder 1 TDC (vehicles with manual transmission).



- A** - Turn crankshaft to cylinder 1 TDC (vehicles with automatic transmission).

With engine removed:

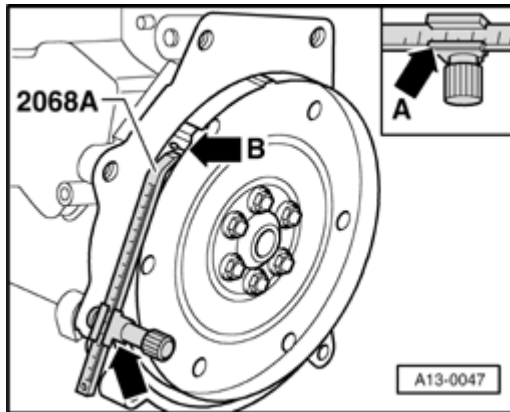
Vehicles with manual transmission



- A** - Install adjustment device 2068 A as shown.
- Set adjustment device to 96 mm (arrow A). Left notch of vernier scale is reference point.
- Turn crankshaft until flywheel TDC marking aligns with point on setting device (arrow B).

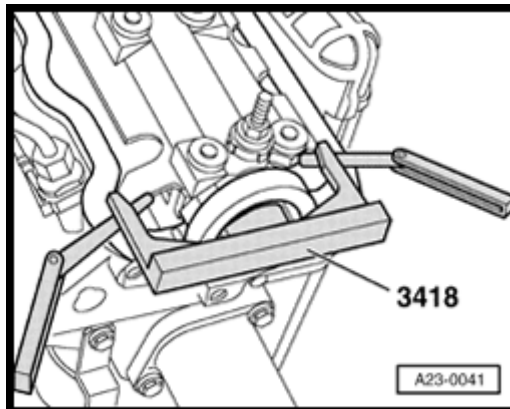


Vehicles with automatic transmission

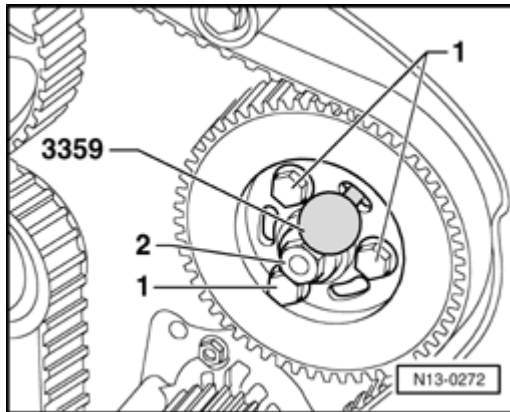


- A - Install adjustment device 2068 A as shown.
- Set adjustment device to 30 mm (arrow A). Left notch of vernier scale is reference point.
- Turn crankshaft until flywheel TDC marking aligns with point of setting device (arrow B).

Continued for all vehicles



- A - Lock camshaft using 3418 setting bar.
- Center setting bar as follows:
 - Turn camshaft so that one end of setting bar contacts cylinder head.
 - Using a feeler gauge, establish gap at other end of setting bar.
 - Place a feeler gauge corresponding to one half gap between setting bar and cylinder head.
 - Turn camshaft until setting bar contacts feeler gauge.
 - Place a 2nd feeler gauge of same thickness at other end between setting bar and cylinder head.

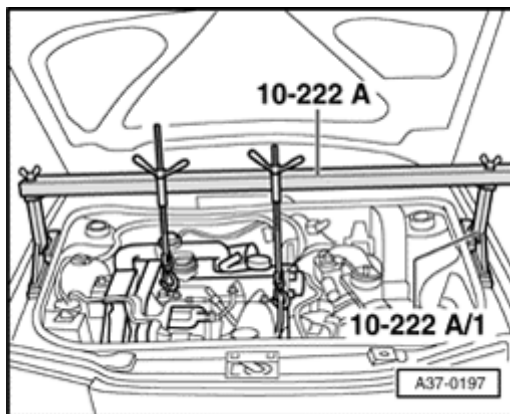


A

- Lock injection pump sprocket with 3359 pin.
- Loosen injection pump sprocket mounting bolts -1- in sequence. Always replace with new bolts when installing.

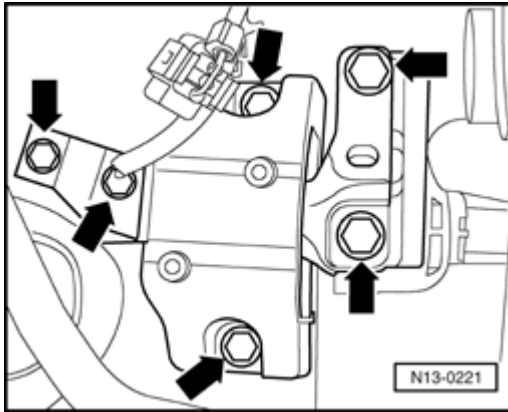
Note:

Do NOT loosen hub nut -2-! Otherwise the diesel injection pump basic setting will be altered and cannot be reset with normal workshop equipment.

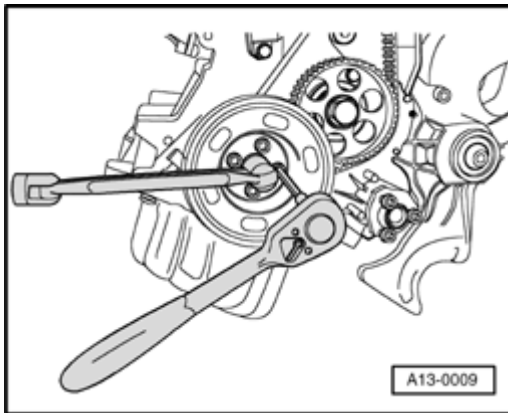


A

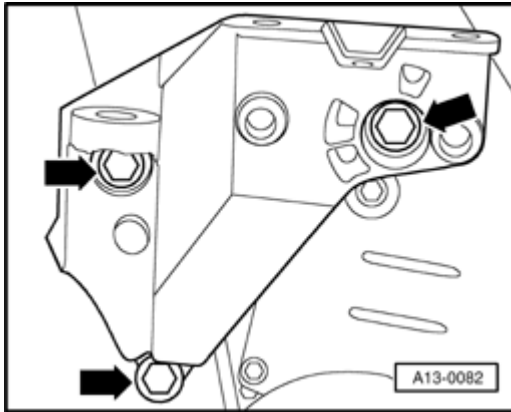
- Install 10-222A support with 10-222A/1 legs as shown.
- Remove coolant expansion tank (coolant hoses remain attached).
- Remove power steering fluid reservoir (hoses remain attached).



- A
- Remove engine mount at engine side completely (arrows).



- A
- Remove vibration damper/pulley.
 - Remove middle and lower toothed belt covers.



A

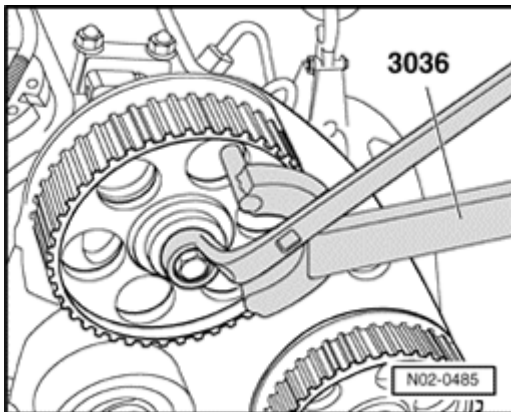
- Remove engine mount bracket at bolts (arrows).

Note:

Raise engine using engine support to remove forward bolt for engine mount bracket.

- Mark direction of rotation on toothed belt.
- Release belt tensioner and remove toothed belt.

Installing

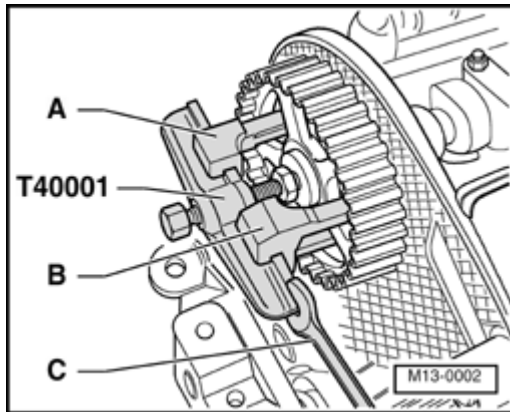


A

- Ensure that TDC mark on flywheel and reference mark are aligned.
- Loosen camshaft sprocket mounting bolt 1 turn. Hold camshaft sprocket using 3036 holding tool.

Note:

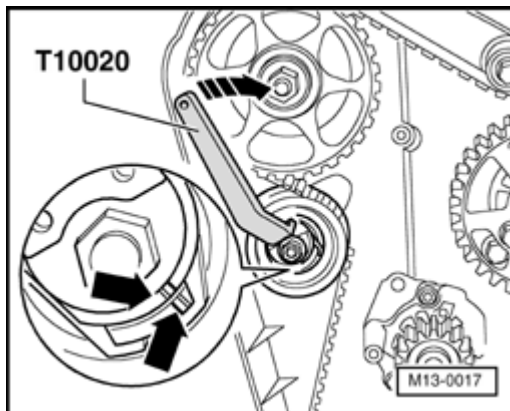
Do not use 3418 setting bar to lock camshaft when removing and installing camshaft sprocket. Hold camshaft sprocket using 3036 holding tool.



A

- Remove camshaft sprocket using T40001 two-arm puller with one arm -A- and second arm -B- centered on camshaft sprocket.
- Counter-hold puller using open end wrench -C-.
- Install toothed belt (note engine direction of rotation) on crankshaft toothed belt sprocket, idler pulley, injection pump sprocket, water pump sprocket and tensioning roller.
- Adjust injection pump sprocket on mount so mounting slots are centered.
- Install camshaft sprocket together with toothed belt and position using mounting bolt.
 - Camshaft sprocket should still turn

Vehicles with manual transmission

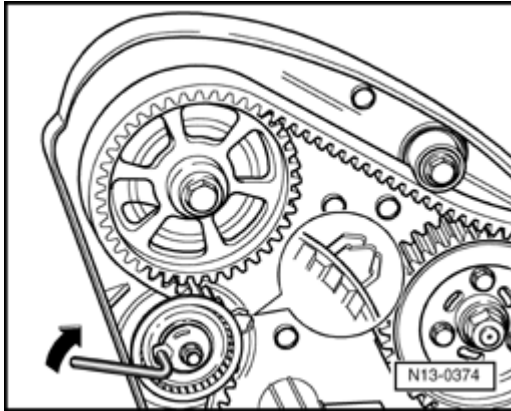


A

- Tension toothed belt using T10020 pin wrench on eccentric, turn clockwise until notch and raised mark align (arrows).



Vehicles with automatic transmission



- ▲ - Tension toothed belt using allen wrench on eccentric, turn clockwise until notch and pointer align.

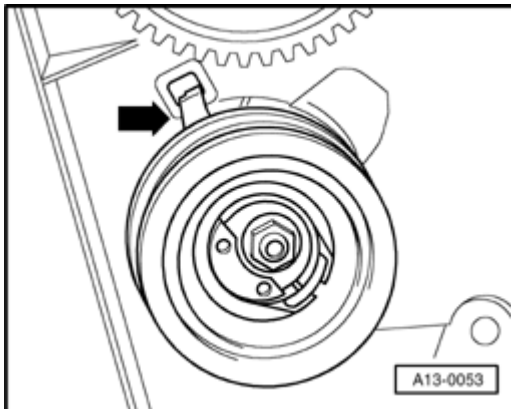
Note:

If adjusting cam is turned too far and correct tension is exceeded, tension must be fully released, then readjusted.

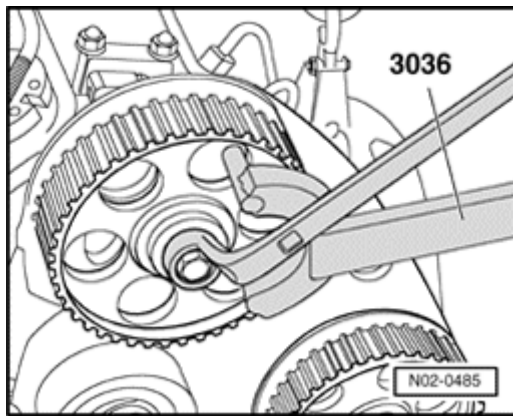
Continued for all vehicles

- Tighten lock nut on tensioning roller. Tightening torque: 20 Nm (15 ft lb)

Note:



- ▲ *Observe correct installation of the tension roller in the rear toothed belt guard (arrow).*
- Check TDC mark on flywheel again.



A

- Tighten camshaft sprocket mounting bolt using 3036 holding tool to prevent sprocket from turning. Tightening torque: 45 Nm (33 ft lb)
- Tighten the new mounting bolts of injection pump sprocket. Tightening torque: 20 Nm (15 ft lb)

Note:

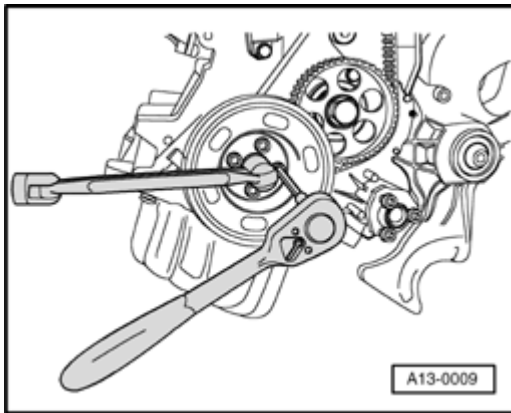
- ◆ *After dynamically testing the "start of injection", re-tighten the mounting bolts about 90° (1/4 turn.).*
 - ◆ *The mounting bolts (stretch bolts) must only be used one time.*
- Remove 3418 setting bar from camshaft.
 - Remove 3359 locking pin.
 - Turn crankshaft two rotations in engine direction of rotation and set again to cylinder 1 TDC.
 - Check belt timing again.
 - Attach engine mount bracket to engine block. Tightening torque: 45 Nm (33 ft lb)



Note:

Install mounting bolts in holes on bracket before attempting to fit bracket to engine block.

- Install middle and lower toothed belt covers.



A

- Install vibration damper/belt pulley
 - Tightening torque: 10Nm (7ft lb) + 1/4 turn (90°) further. Always Replace.
- Install engine mount assembly. If necessary, adjust alignment ⇒ [Page 10-13](#)

Note:

Tightening torques for engine mounts ⇒ [Page 10-16](#)

- Install coolant expansion tank
 - Tightening torque: 10 Nm (7 ft lb)
- Install power steering fluid reservoir
 - Tightening torque: 10 Nm (7 ft lb)
- Install vacuum pump
 - Tightening torque: 20 Nm (15 ft lb)
- Install valve cover
 - Tightening torque: 10 Nm (7 ft lb)
- Install ribbed belt tensioner
 - Tightening torque: 25 Nm (18 ft lb)



- Install pipe between charge air cooler and turbocharger.

⇒ [Page 21-6](#)

- Install ribbed belt.

⇒ [Page 13-12](#)

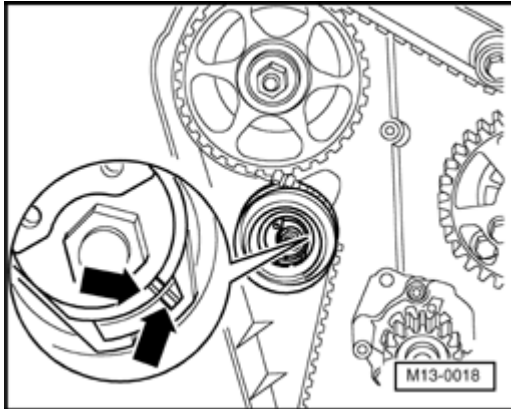
- Check Diesel injection pump start of delivery.

⇒ [Repair Manual, 1.9 Liter 4-Cyl. 2V TDI Fuel Injection & Glow Plug, Engine Code\(s\): ALH, Repair Group 23](#)



Semi-automatic toothed belt tensioning roller, checking

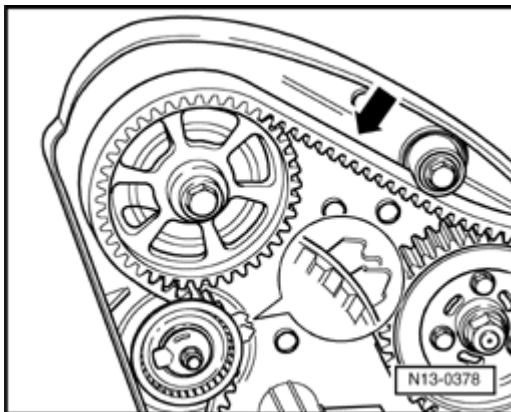
Vehicles with manual transmission



A

- Tension toothed belt with firm thumb pressure.
 - Notch and raised portion (arrows) must move apart.
- Release thumb pressure on toothed belt.
 - Tensioning roller must move back to its initial position, notch and raised portion must align again.

Vehicles with automatic transmission



A

- Tension toothed belt with firm thumb pressure.
 - Notch and pointer (arrows) must move apart.
- Release thumb pressure on toothed belt.
 - Tensioning roller must move to take up any slack in toothed belt.

Note:

The tensioning indicator does not return to the initial position on vehicles with an automatic transmission.