

Dismantling and assembling engine

Removing and installing toothed belt

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

- ◆ Lever 3297 (for ribbed belt drive without tensioning roller).
- ◆ Lever 3299 (for ribbed belt drive with tensioning roller).
- ◆ Setting bar 2065 A
- ◆ Pin 2064 (for single part injection pump sprocket)
- ◆ Pin 3359 (for two part injection pump sprocket)
- ◆ Counter-hold tool 3036
- ◆ Pin wrench Matra V159
- ◆ V.A.G 1331 Torque wrench (5...50 Nm)

Engines without semi-automatic tensioning roller:

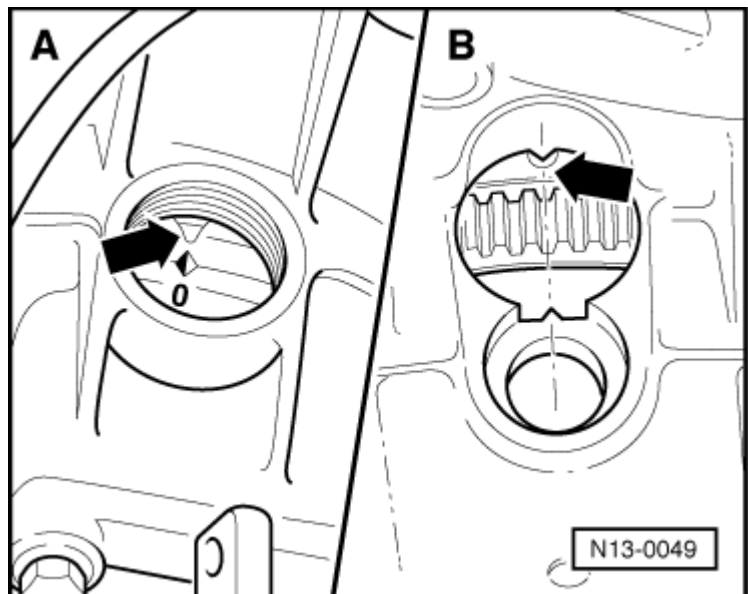
- ◆ V- and toothed belt test unit VW 210

Belt drive with single part injection pump sprocket

Belt drive with two part injection pump sprocket =>Page [13-26](#)

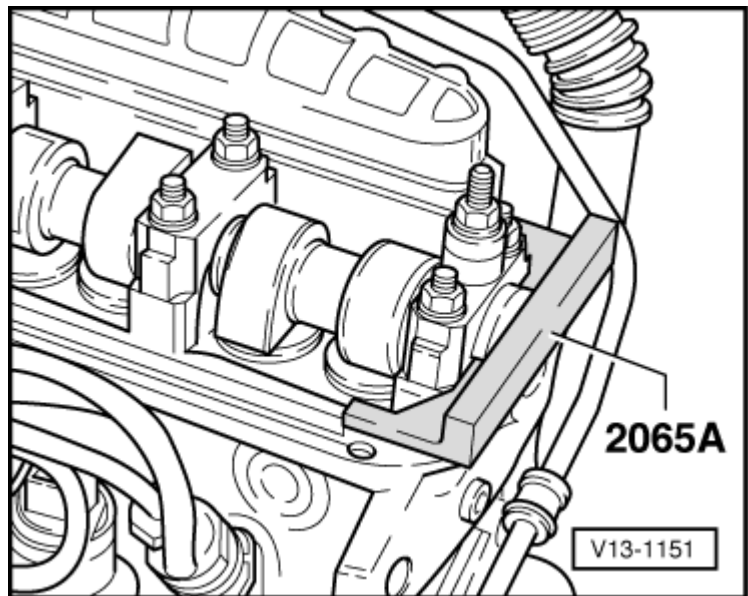
Removing

- – Remove ribbed belt => Page [13-16](#).
- – If fitted remove ribbed belt tensioning roller.
- – Remove upper toothed belt guard and cylinder head cover.
- – → Turn crankshaft to TDC No. 1 cylinder.
 - A: Engine codes 1Y, AAZ, AEY
 - B: Engine codes 1Z, AHU, AFN, AVG, ALE



- – → Lock camshaft with setting bar.
- – Centralize 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

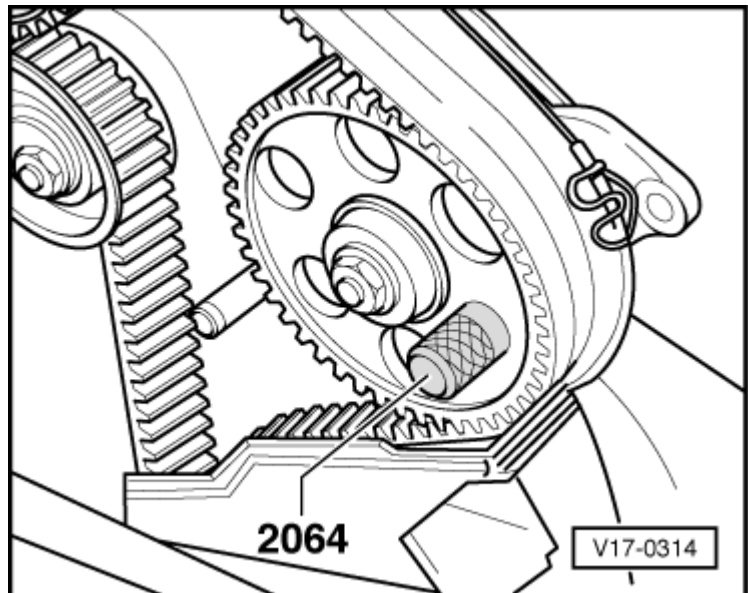
gauge. Place a 2nd feeler gauge, of same thickness, at the other end between setting bar and cylinder head.



- – → Lock injection pump sprocket with pin.
- – Loosen tensioner.
- – Remove vibration damper and belt pulley.
- – Remove lower toothed belt guard.
- – Mark D.O.R. of toothed belt.

Engines with semi-automatic tensioning roller:

- – Remove idler roller.
- – Take off toothed belt.



Installing

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

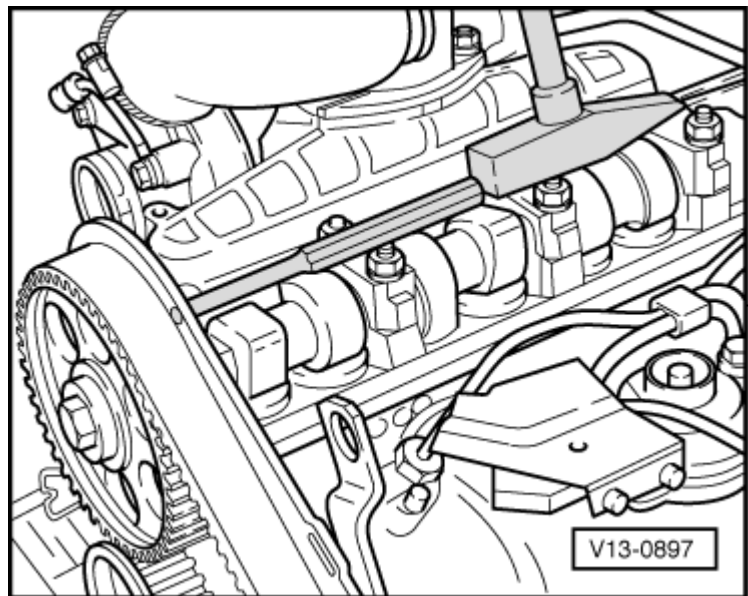
Note:

Never use setting bar as a counter hold when loosening and tightening the camshaft sprocket, use retainer 3036.

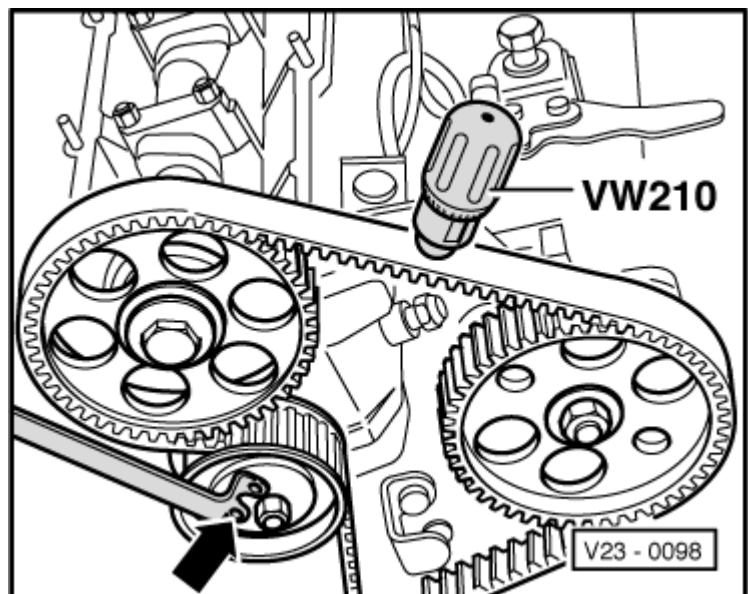
- – → Loosen camshaft sprocket securing bolt 1/2 turn. Release camshaft sprocket from camshaft taper by tapping with a hammer (using a drift through rear toothed belt guard opening).

Engines without semi-automatic

tensioning roller:



- – → Fit toothed belts (note D.O.R.) and remove pin from fuel injection pump sprocket.
- – Tension toothed belts (turn tensioner with pin wrench e.g. Matra V159 -arrow- to right).
Scale value: 12 ... 13 measured between camshaft sprocket and injection pump sprocket.
- – Tighten lock nut on the tensioner.
Tightening torque: 45 Nm
- – Tighten camshaft sprocket securing bolt to 45 Nm.
- – Remove setting bar.
- – Turn crankshaft two rotations in engine D.O.R. and again check toothed belt tension.



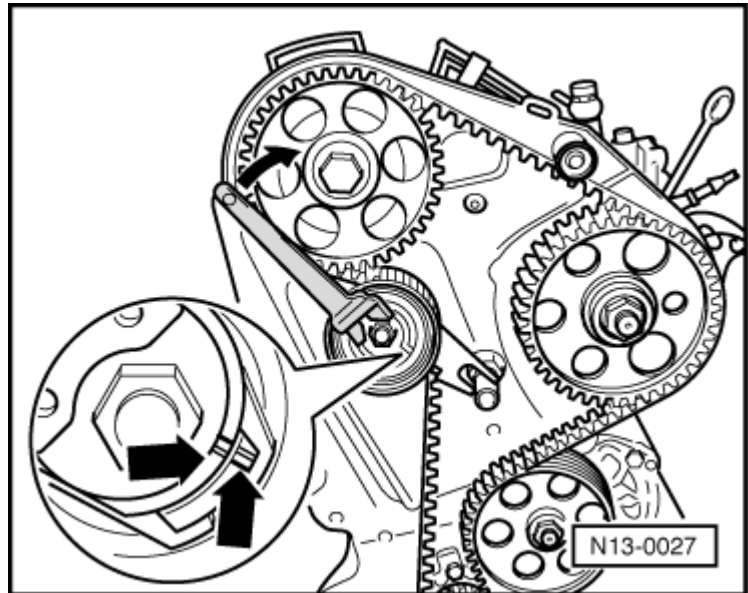
Engines with semi-automatic tensioning roller:

- – Fit toothed belt (note direction of rotation) and remove pin from injection pump sprocket.
- – Install idler roller.
Tightening torque: 25 Nm
- – → Turn tensioning roller with pin wrench (e.g. Matra V159) to right until notch aligns with raised portion (arrows).

Note:

If the eccentric has been turned too far the tensioning roller must be relieved completely and retensioned. The eccentric must never be turned back when it has been turned too far.

- – Tighten lock nut on tensioning roller.
Tightening torque: 20 Nm
- – Check again whether TDC mark on flywheel and reference mark are aligned.
- – Tighten camshaft sprocket securing bolt to 45 Nm.
- – Remove setting bar.
- – Turn crankshaft two rotations in engine D.O.R. until crankshaft is set to TDC No. 1 cylinder again.
- – Check if
 - the TDC mark on flywheel
 - the setting bar on camshaft
 - the mandrel 2064 in injection pump sprocket
 - the tensioning roller setting (notch/raised mark)
 - align/are fitted correctly.
- – If notch and raised mark do not align, tension the tensioning roller. To do this, hold tensioning roller with pin wrench Matra V159, loosen securing nut, turn eccentric clockwise further until notch and raised mark align opposite one another and tighten securing nut to 20 Nm.
- – Turn crankshaft two rotations in engine D.O.R. until crankshaft is set to TDC No. 1 cylinder again.
- – Repeat check.



Continuation for all engines

- – Install toothed belt guard, vibration damper, belt pulley, and cylinder head cover.
- – Install ribbed belt => Page [13-16](#).

Engine codes 1Z, AHU, AEY, AFN, AVG, ALE

- – Checking injection pump commencement of delivery:

=> [Repair group 23; Servicing Diesel direct injection system; Dynamically checking and adjusting injection pump commencement of delivery.](#)

Engine codes 1Y, AAZ

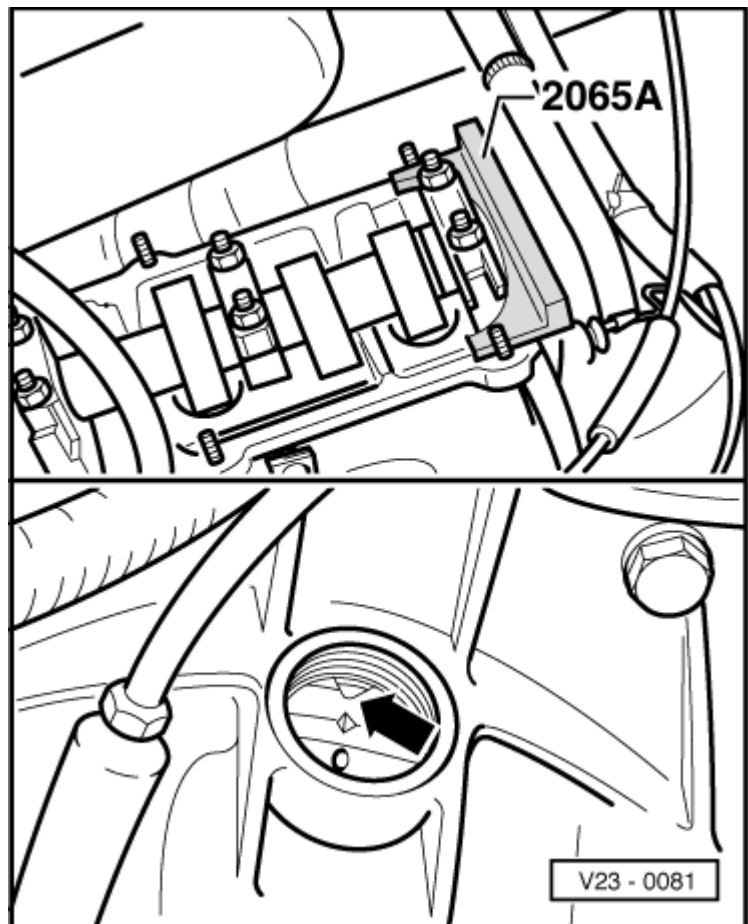
- – Check injection pump commencement of delivery:

=> [Repair group 23; Servicing Diesel injection system; Checking and adjusting injection pump commencement of delivery \(static\).](#)

Belt drive with two part injection pump sprocket

Removing

- – Remove ribbed belt => Page [13-16](#).
- – If fitted remove ribbed belt tensioning roller.
- – Remove upper toothed belt guard and cylinder head cover.
- – → Turn crankshaft to TDC No. 1 cylinder -arrow-.
- – Lock camshaft with setting bar.
- – Centralize 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.
- – → Lock injection pump sprocket with pin 3359.
- – Loosen injection pump sprocket securing bolts -1-.
- – Loosen tensioner.
- – Remove vibration damper and belt pulley.
- – Remove lower toothed belt



guard.

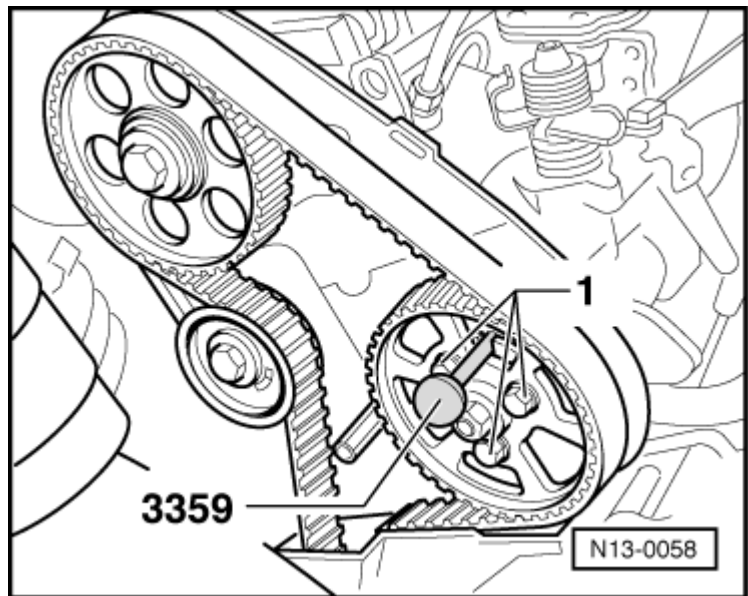
- – Mark D.O.R. of toothed belt.
- – Take off toothed belt.

Installing

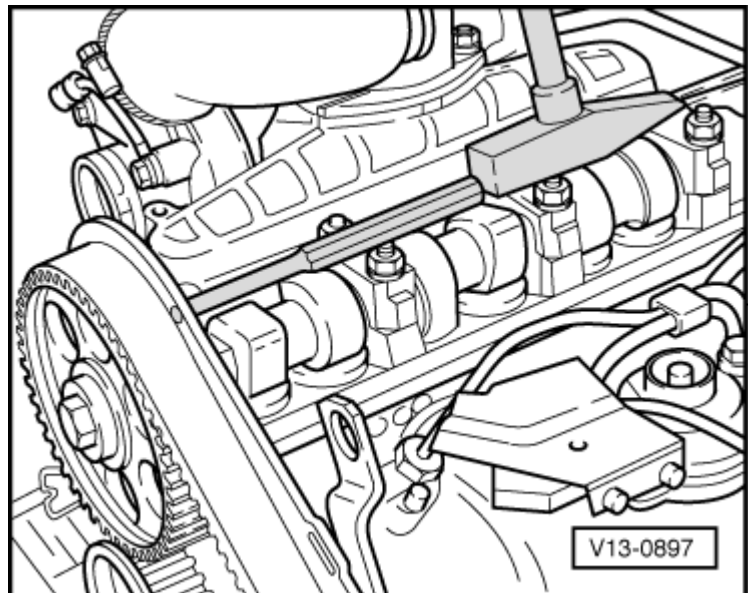
- – Check whether TDC mark on flywheel and reference mark are aligned.

Note:

Never use setting bar as a counter hold when loosening and tightening the camshaft sprocket, use retainer 3036.



- – → Loosen camshaft sprocket securing bolt 1/2 turn. Release camshaft sprocket from camshaft taper by tapping with a hammer (using a drift through rear toothed belt guard opening).
- – Fit toothed belts (note D.O.R.) on crankshaft toothed belt sprocket, intermediate wheel, injection pump sprocket and tensioning roller.
- – Fit camshaft sprocket together with toothed belt and locate with securing bolt (camshaft sprocket can still turn).

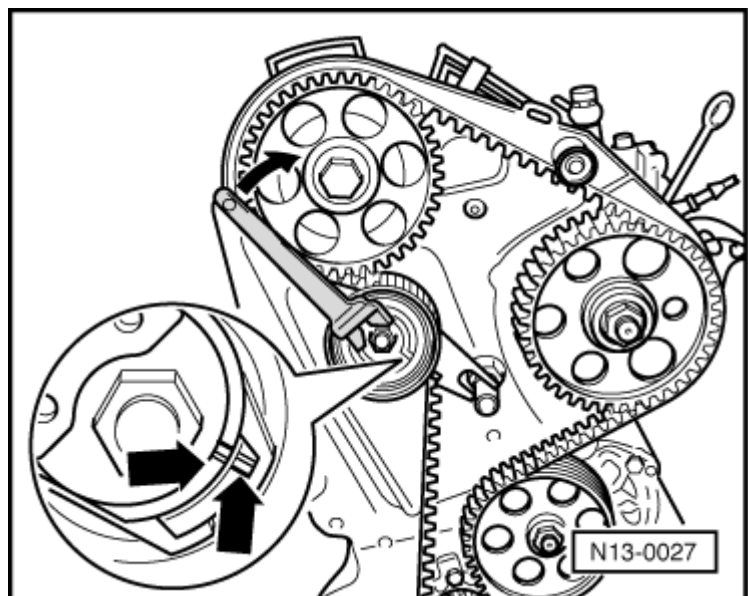


- – → Turn tensioning roller with pin wrench (e.g. Matra V159) to right until notch aligns with raised portion (arrows).

Note:

If the eccentric has been turned too far the tensioning roller must be relieved completely and retensioned. The eccentric must never be turned back when it has been turned too far.

- – Tighten lock nut on tensioning roller.
Tightening torque: 20 Nm
- – Check again whether TDC mark on flywheel and reference mark are aligned.



- – Tighten camshaft sprocket securing bolt to 45 Nm.
- – Tighten injection pump sprocket securing bolts to 25 Nm.
- – Remove setting bar 2065 A from camshaft and pin 3359 from injection pump sprocket.
- – Turn crankshaft two rotations in engine D.O.R. until crankshaft is set to TDC No. 1 cylinder again.
- – Check if
 - the TDC marking on flywheel
 - the setting bar on camshaft
 - the pin 3359 in injection pump sprocket
 - the tensioning roller setting (notch/raised mark) align/are fitted correctly.
- – If notch and raised mark do not align, tension the tensioning roller. To do this, hold tensioning roller with pin wrench Matra V159, loosen securing nut, turn eccentric clockwise further until notch and raised mark align opposite one another and tighten securing nut to 20 Nm.

→ If the injection pump sprocket cannot be locked with pin 3359:

- – Loosen injection pump securing bolts -1-.
- – Turn injection pump sprocket hub until the pin fits.
- – Tighten injection pump sprocket securing bolts to 25 Nm.
- – Turn crankshaft two rotations in engine D.O.R. until crankshaft is set to TDC No. 1 cylinder again.
- – Repeat check.
- – Install toothed belt guard, vibration damper, belt pulley, and cylinder head cover.
- – Install ribbed belt => Page [13-16](#).

