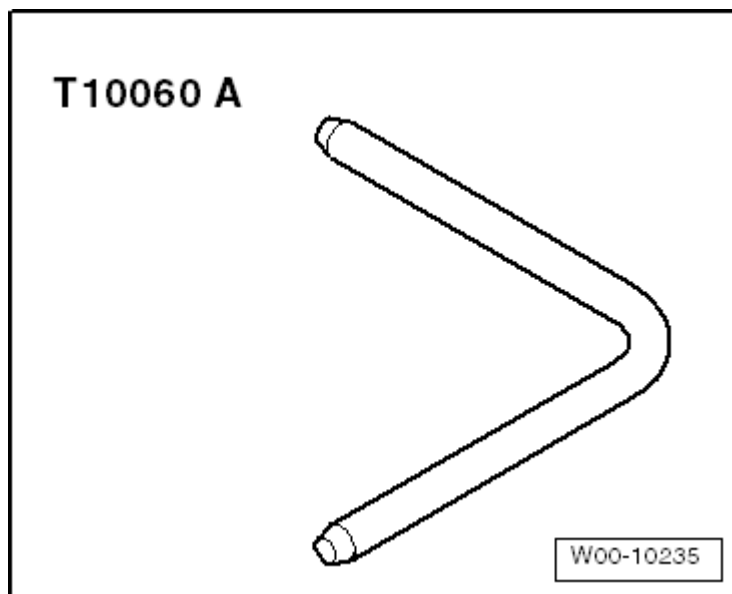


Removing and installing balance shaft and retaining frame

Special tools and workshop equipment required

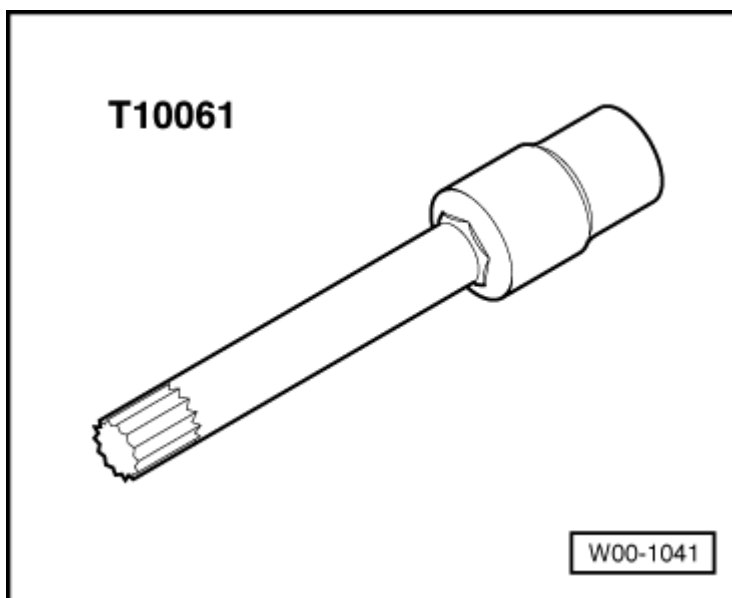
- ♦ Locking pin -T10060 A-



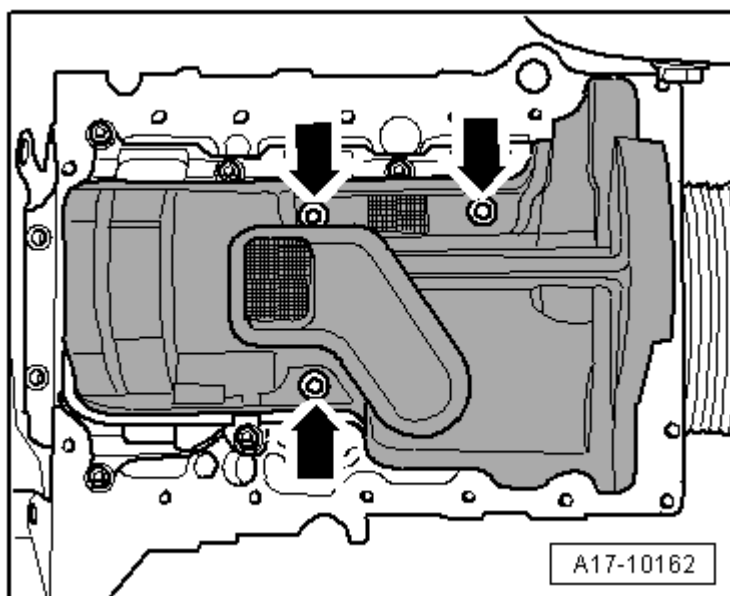
- ♦ Socket -T10061-

Removing

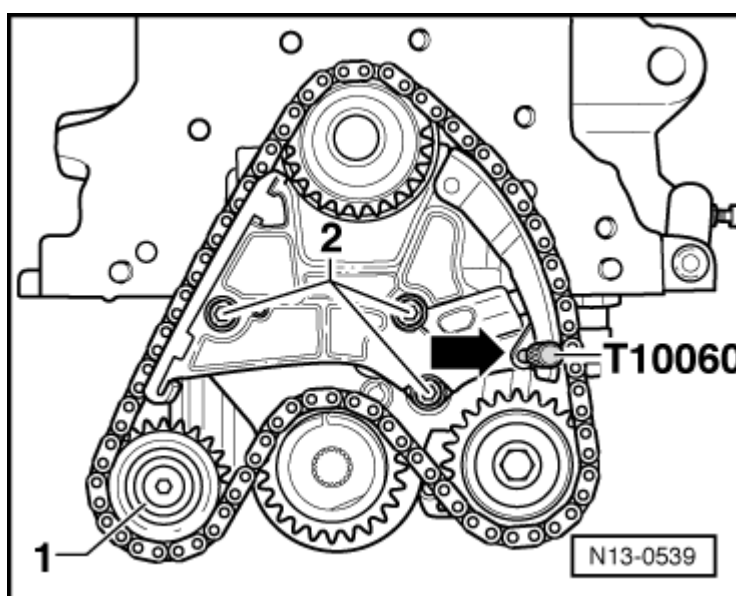
- Remove poly V-belt → Chapter.
- Remove toothed belt: toothed belt drive with hydraulically damped tensioning roller → Chapter, toothed belt drive with friction-damped tensioning roller → Chapter.
- Remove sump → Chapter.
- Remove sealing flange (pulley end) → Chapter.



- Remove bolts -arrows-.
- Release the 5 retaining tabs and remove baffle plate.



- Press down chain tensioner and lock with locking pin -T10060 A--arrow-.
- Unbolt idler sprocket -1- from retaining frame.
- Unscrew bolts -2- and remove chain tensioner.
- Remove chain from sprockets and lay it aside on a clean surface.



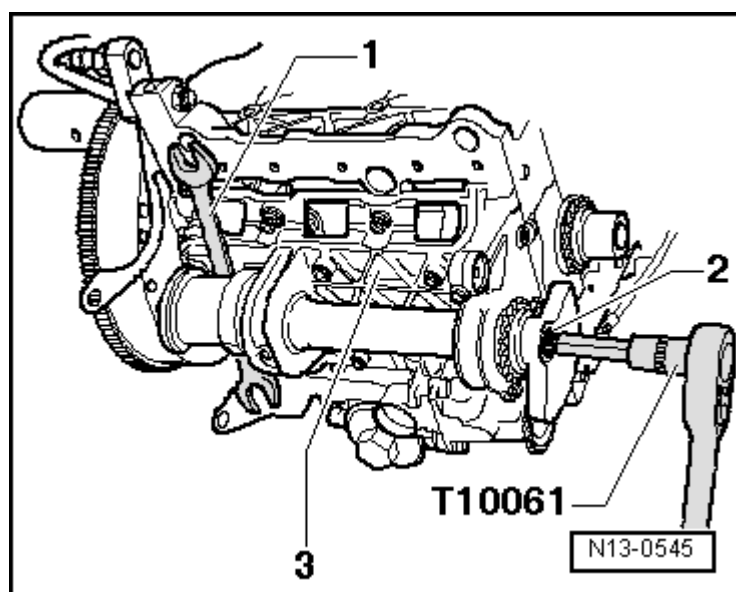
- Block balance shaft as shown using a spanner (24/27 mm) -item 1-.
- When blocking the balance shaft, make sure that the spanner is centred on the balance weight and at right angles to the balance shaft.
- Loosen bolt -2- at balance weight using socket -T10061-.



Note

Do not unscrew bolt all the way when loosening.

- Unbolt retaining frame -3- from cylinder block and remove retaining frame with balance shaft.
- Lay retaining frame aside on a clean surface.



- Unscrew bolt on balance weight and detach balance weight and chain sprocket.
- Turn balance shaft so that it can be removed from the bearings.

Installing

Installation is carried out in the reverse order; note the following:



Note

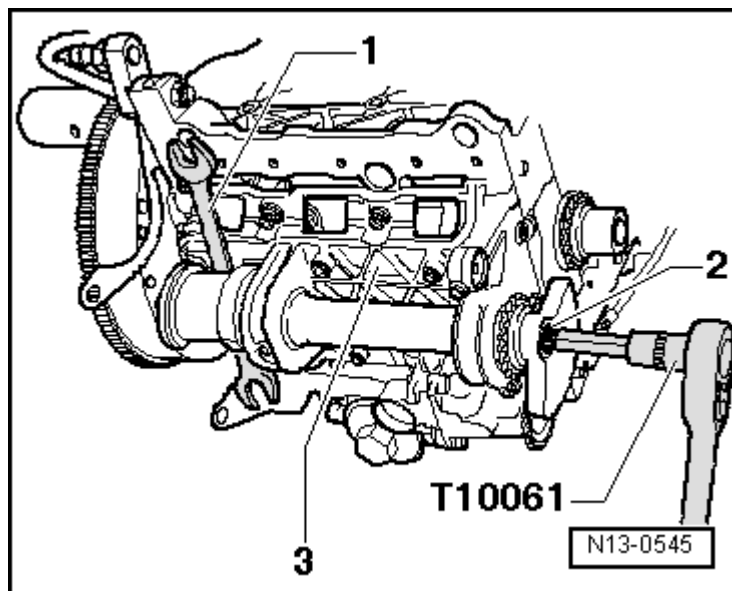
- ♦ *Renew O-ring.*
- ♦ *Renew the bolts tightened with specified tightening angle.*
- Lubricate contact surfaces of bearing and insert balance shaft.
- Fit chain sprocket and balance weight on balance shaft.



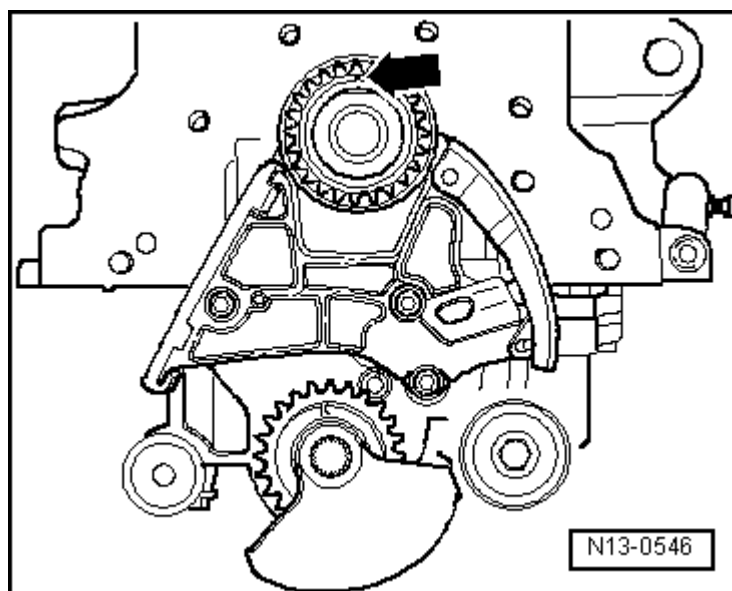
Note

Chain sprocket and balance weight can only be fitted in one position.

- Tighten bolt for balance weight/chain sprocket hand-tight.
- Check that dowel sleeve in cylinder block and O-ring in retaining frame are in position before installing retaining frame.
- Tighten retaining frame -3- to cylinder block hand-tight and align.
- Check that retaining frame aligns flush with outer edge of cylinder block on pulley end.
- Tighten retaining frame in stages and in diagonal sequence.
- Block balance shaft as shown using a spanner (24/27 mm) -item 1-.
- When blocking the balance shaft, make sure that the spanner is centred on the balance weight and at right angles to the balance shaft.
- Secure balance weight using new bolt -2-.
- Install chain tensioner.



- Clean chain with a lint-free cloth.
- Ensure that mark -arrow- on crankshaft sprocket is at top.



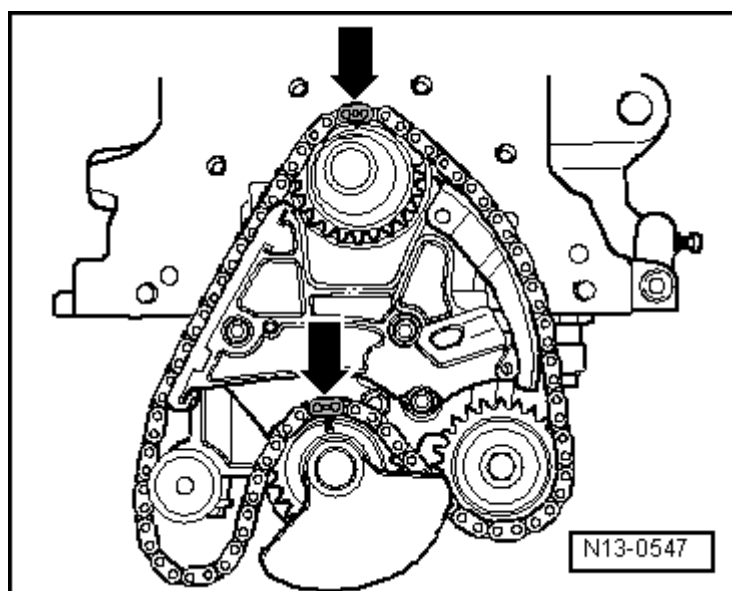
- Lay chain over crankshaft sprocket, oil pump sprocket and balance shaft sprocket.
- Ensure that marks on crankshaft sprocket and balance shaft sprocket align with the colour-coded chain links -arrows-.



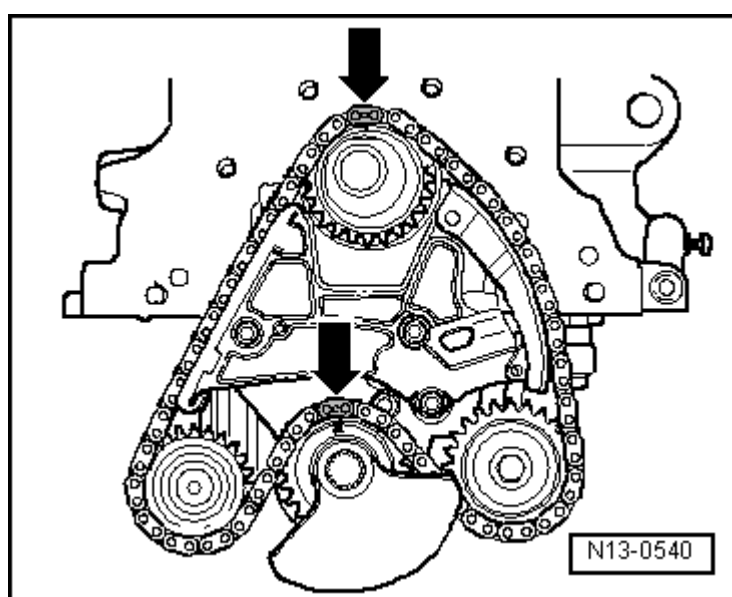
Note

The colour-coded chain links are additionally marked with a notch.

- Engage idler sprocket in chain and tighten idler sprocket to retaining frame.
- Remove locking pin from chain tensioner.



- Check that marks on crankshaft sprocket and balance shaft sprocket align with the colour-coded chain links -arrows-.
- Install sealing flange (pulley end) → **Chapter**.
- Fit baffle plate with new O-ring. To do this:
 - Lubricate O-ring with oil.
 - Lubricate sleeve on inside of baffle plate with oil.
 - Make sure sealing tape is properly applied.
 - Make sure baffle plate engages properly in retaining frame.
- Install sump → **Chapter**.
- Install toothed belt (adjust valve timing): toothed belt drive with hydraulically damped tensioning roller → **Anchor**, toothed belt drive with friction-damped tensioning roller → **Anchor**.



- Install poly V-belt → **Chapter**.

Tightening torques

Component	Nm
Retaining frame with balance shaft to cylinder block	14 + 180° ¹⁾²⁾
Balance weight with chain sprocket to retaining frame	100 + 90° ¹⁾³⁾
Chain tensioner to retaining frame	8 + 90° ¹⁾³⁾
Idler sprocket to retaining frame	20
Baffle plate to retaining frame	5
<ul style="list-style-type: none"> • ¹⁾ Renew bolt(s). • ²⁾ 180° = one half turn. • ³⁾ 90° = one quarter turn. 	