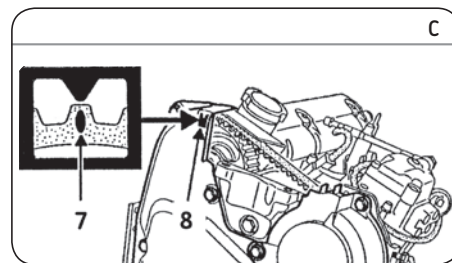
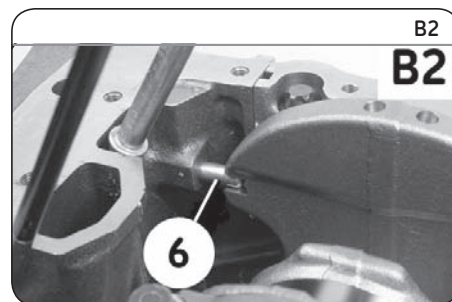
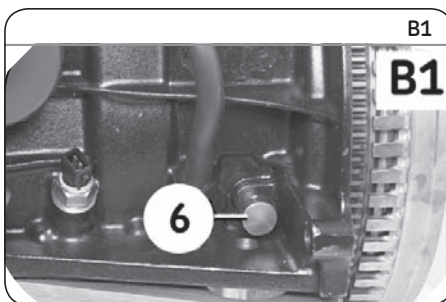
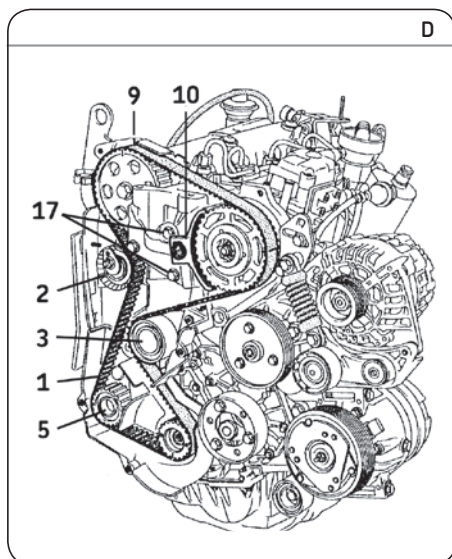
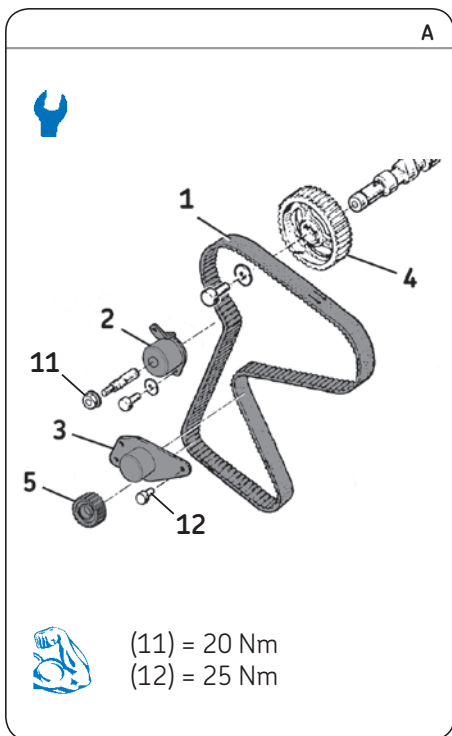


VKMA 06117

VKMA 06137



Note: VKMA 06137 has 1 more idler (5) than VKMA 06117 due to the oil pump is driven by this idler in some applications

Removal

- 1) Disconnect the battery according to the vehicle manufacturing guidelines.
- 2) Prepare the vehicle for the timing replacement according to the vehicle manufacturing guidelines.
- 3) Remove the auxiliary belt, crankshaft pulley and the TDC gauge plug. Then place the TDC gauge (6) instead of the plug without pushing it fully in (Fig. B1).
- 4) Rotate the engine **clockwise**. As soon as the mark (7) on the camshaft sprocket appears inside the window (8) (Fig. C) on the timing casing, press the gauge (6) until the crankshaft is located in the timing position (Fig. B2). The mark (7) on the sprocket must then be aligned with the indicator mark on the casing (Fig. C.)
- 5) Remove the timing system casings.

Note: After removing the timing system casing, draw a mark (9) on the rear casing, which lines up with the mark on the camshaft sprocket (Fig. D).

- 6) Fit the injection pump pulley locking tool (10) (Fig. D).
- 7) Loosen the fastening nut (11) of the tensioner roller (2) and unscrew it approximately 8 mm (Fig. E1).
- 8) To make the timing belt easier to remove, the tensioner locating pin (12) must be removed from the slot (13) in the engine block (Fig. E).
- 9) Pull the roller in the direction of the arrows (14) and push it towards the left (direction of the arrow (15)) until the plate (16) touches the rear casing (Fig. E).
- 10) Remove the timing belt (1) (Fig. A).

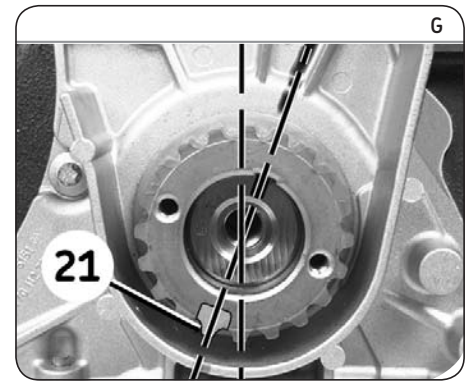
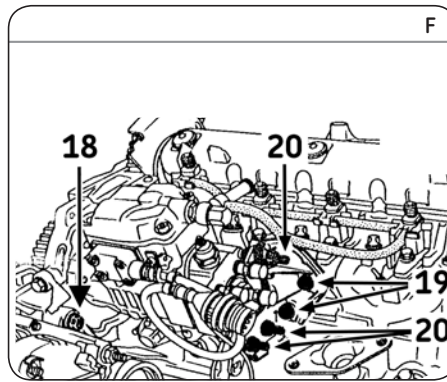
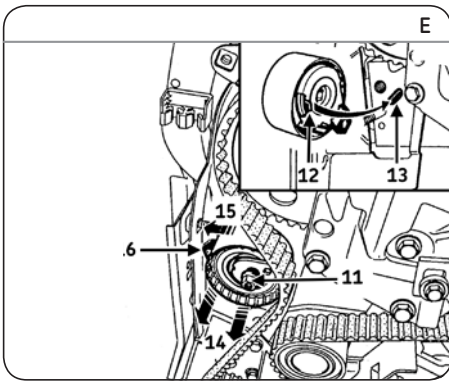
- Remove the two fastening bolts for the accessory belt tensioner roller (for a vehicle with air conditioning) or the upper bolt of the alternator (for a vehicle without air conditioning).
- Remove the oil decanter and high pressure hoses using the removal tool Eng. 1383.
- Remove the bolt (18), the two fastening bolts (19) for the injection pump and loosen the three fastenings (20) (Fig. F).
- Remove the worn camshaft sprocket by pushing the injection pump back.
- Fit the new camshaft sprocket (4) and tighten its fastening bolt to **60 Nm (Fig. A)**.
- Retighten the fastening bolt for the swivel bracket on the cylinder head to **35 Nm**.
- Refit the two fastening bolts (19) for the injection pump, see (Fig. F).
- Firstly, retighten the three fastenings (20) and then the fastenings (19) to **30 Nm (Fig. F)**.
- Refit and tighten the bolt (18) to **30 Nm (Fig. F)**.

- 11) Remove the tensioner rollers (2), idler rollers (3) and (5) (Fig. A) (the roller (5) must be removed when fitting the VKMA 06137 kit)

Note: Camshaft sprocket must be replaced
Operations to change the camshaft sprocket.
- Unscrew the fastening bolts (17) for the cylinder head swivel bracket by approximately 12 mm (Fig. D)

Install Confidence





Refitting

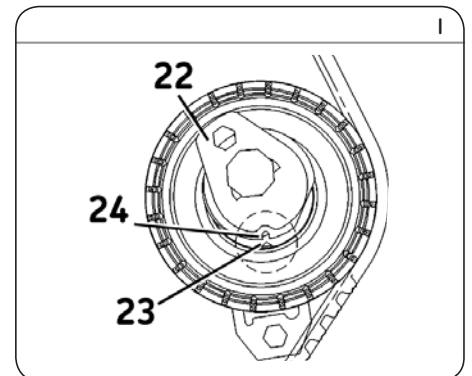
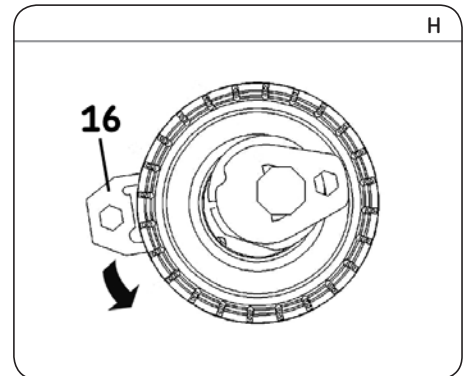
Caution! First clean the bearing surfaces of the rollers.

- 12) Check the timing marks: with the TDC gauge (6) (Fig. B2) in position, align the mark (7) on the camshaft sprocket with the mark on the rear casing (9) (Fig. C and D), mark (21) on the crankshaft sprocket offset by one tooth to the left relative to the vertical axis (Fig. G).
- 13) Refit the new idler roller (3) (Fig. A). Tighten the fastening bolts (12) to 25 Nm.
- 14) Refit the new idler roller (5) (if fitting the VKMA 06137 kit) (Fig. A).
- 15) Refit the new tensioner roller (2): fit the roller so that the plate (16) (Fig. H) presses against the rear casing.
- 16) Refit the timing belt (1) in the following order: crankshaft sprocket, idler roller (3), injection pump sprocket, camshaft sprocket, idler roller (5) (if fitting the VKMA 06137 kit) and tensioner roller (2) (Fig. D). Check that the marks on the belt line up with the marks on the camshaft, injection pump and crankshaft sprockets.
- 17) Rotate the plate (16) of the tensioner roller (2) **anti-clockwise** using an Allen key (Fig. H) in order to be able to push the roller and place the locating pin (12) in the slot (13) in the engine block (Fig. E).

Caution: the tensioner roller plate must not press against the rear casing.

- 18) Tighten the fastening nut (11) of the tensioner roller slightly by hand (Fig. E).

- 19) Tighten the timing belt (1): Turn the adjustment dial (22) of the tensioner roller (2) in an **anti-clockwise** direction using an Allen key (Fig. I). Continue turning the adjustment dial (22) until the moving pointer (23) is aligned with the notch (24) (Fig. I). Then tighten the roller fastening nut (11) to 10 Nm.
- 20) Remove the TDC gauge (6) (Fig. B1) and the injection pump pulley locking tool (10) (Fig. D).
- 21) Turn the crankshaft through two revolutions in the engine rotation direction. Before aligning the mark (7) on the camshaft sprocket with the indicator mark (9) on the rear casing (Fig. C and D), fit the TDC gauge (6) (Fig. B1) and then continue rotating slowly and without jerking until the crankshaft reaches the timing position (Fig. B2).
- 22) Check that the timing marks (7) and (9) are aligned (Fig. C and D).
- 23) Check the tensioner roller setting: the moving pointer (23) must be aligned with the notch (24) on the tensioner roller (Fig. I).
- 24) If the marks are not aligned, remove the new timing belt and adjust the belt tension again, by returning to step 19.
- 25) Tighten the tensioner roller fastening nut (11) to 20 Nm.
- 26) Remove the TDC gauge (6) (Fig. B1).
- 27) Adjust the injection pump timing, if required.
- 28) Refit the remainder of the removed elements in the reverse order to removal.



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