

VKMA 04107


VKMC 04107-1

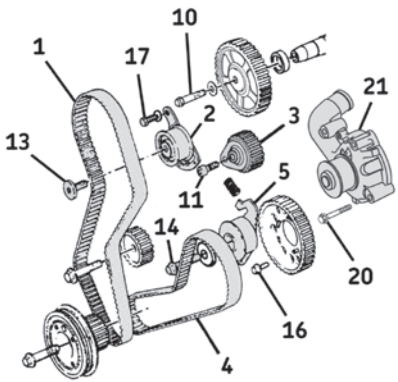
VKMC 04107-2

VKMC 04107-3




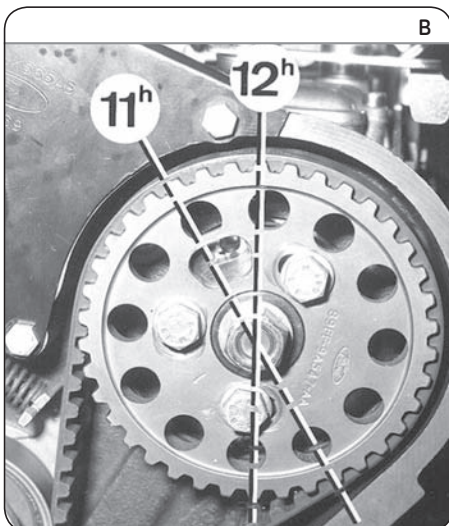
A

 (6): Ref. 21-104.  
(7): Ref. 21.162 B  
(8): Ref. 23-019 (Lucas) ; ref. 23-029 (Bosch).  
(9): Ref. 15-030 A



(10): Camshaft bolt: 35 Nm (M8) / 45 Nm (M10)  
(11): Idler bolt: 20 Nm  
(13): Tensioner bolt: 50 Nm  
(14): Tensioner bolt: 45 Nm  
(17): Tensioner bolt: 10 Nm





**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) Turn the crankshaft **clockwise** until the oblong hole on the injection pump sprocket is in the "11 o'clock" position (**Fig. B**) to set cylinder No.1 at TDC.
- 4) Remove the cap on the housing of the crankshaft pin and engage fully tool (6) in the engine block (**Fig. C**). If required, remove the alternator.
- 5) Turn the crankshaft **clockwise** slowly until it stops on the pin (6).
- 6) Lock the camshaft sprocket using tool (9), and loosen mounting bolt (10) (**Fig. F**). Separate the sprocket from its tapered seat using appropriate tool.
- 7) Remove the cylinder head cover, the valve cover and gasket. In the slot located at the back of the camshaft, position the timing rule (7) (**Fig. D**).
- 8) Insert a timing pin (8) or a drill bit (Ø 16 mm) in the injection pump sprocket (**Fig. E**).
- 9) Loosen the fastening bolt (11) of the idler roller (3) of the camshaft belt. Turn the plate (12) of the roller **counter-clockwise** into the "6 o'clock" position (**Fig. G**). The belt must be loosened. If required, also loosen the bolt (13) on the tensioner roller (2) (**Fig. G**).
- 10) Remove the camshaft belt (1), tensioner roller (2) and idler roller (3) (**Fig. A**).
- 11) Loosen the fastening bolt (14) of the tensioner roller (5) from the injection pump belt (4) (**Fig. E**). Compress the spring (15) on the roller using a suited clamp, and tighten the fastening bolt in this position. The belt must be loosened.
- 12) Remove the injection pump belt (4) and the tensioner roller (5).
- 13) **Removing the water pump (VKMC 04107-1/-2/-3):** firstly bleed the cooling circuit, check it is clean, and clean if required; secondly fully loosen the water pump fastening bolts (20) and remove the pump (21) (**Fig. A**).

**Refitting**

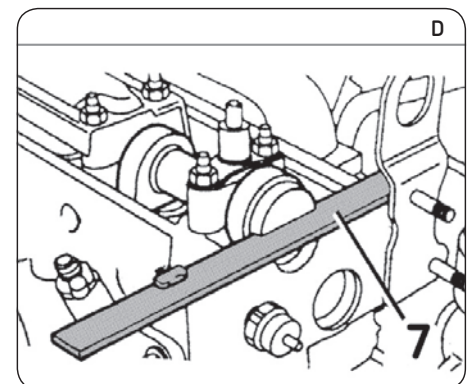
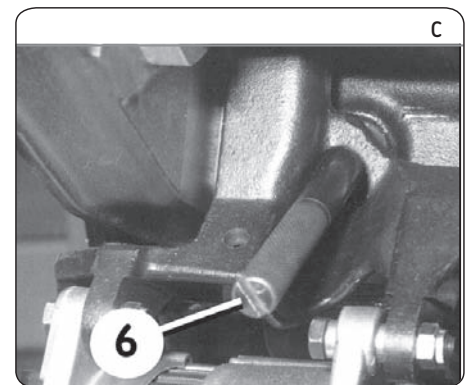
**Caution!** First clean thoroughly the bearing surfaces of the rollers.

- 14) **Refitting the water pump:** Firstly fit the new water pump (21), then check that the water pump pulley runs properly, and has no hard or locking spots. Fitting the injection pump belt and tensioner roller:
- 15) Check that the crankshaft is still stopped against the pin (6) (**Fig. C**) and that the timing pin (8) (**Fig. E**) is properly in place.

- 16) Fit the new tensioner roller (5), compress the spring (15) and tighten the new fastening bolt (14) to maintain the roller in position (**Fig. E**). Fit the new injection pump belt (4), starting with the crankshaft sprocket and according to the engine rotation direction indicated by the arrows on the belt.
- 17) Untighten by a half-turn each bolt (16) of the sprocket of the injection pump (**Fig. E**).
- 18) Untighten the bolt (14) of the tensioner roller (5), then let it move. The belt is tightened automatically.
- 19) Check the bolts (16) and the pin (8) of the injection pump sprocket are located approximately at the middle of their slots (**Fig. E**).
- 20) Tighten the fastening bolts (16) of the injection pump sprocket at a torque of 23 Nm (**Fig. E**).
- 21) Tighten the bolt (14) on the tensioner roller (5) at the torque 45 Nm (**Fig. E**).

**Fitting the camshaft belt and rollers:**

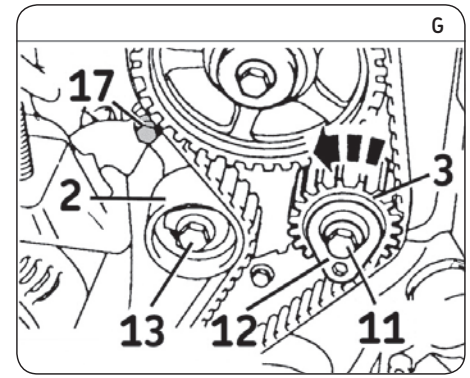
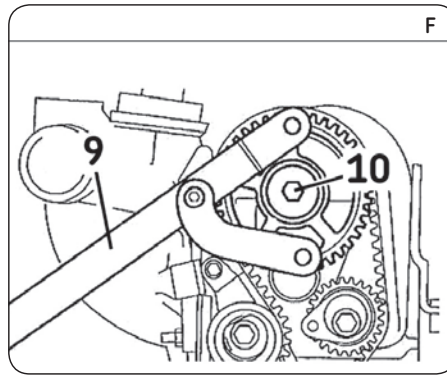
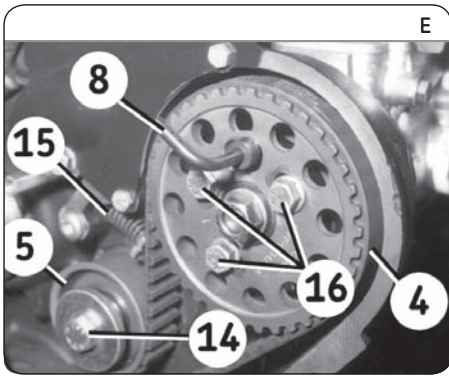
- 22) Check that the timing rule (7) is positioned properly (**Fig. D**).



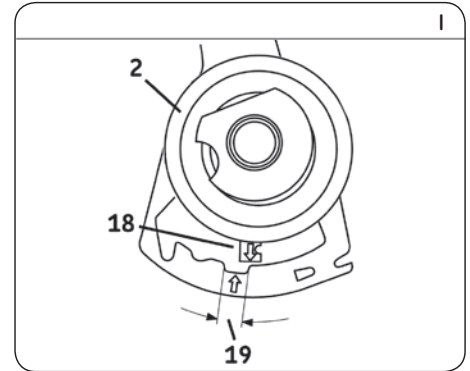
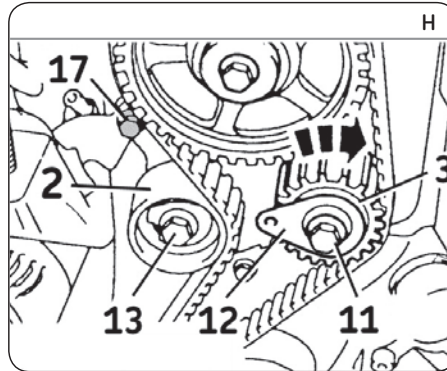
**Install Confidence**

VKN 1006



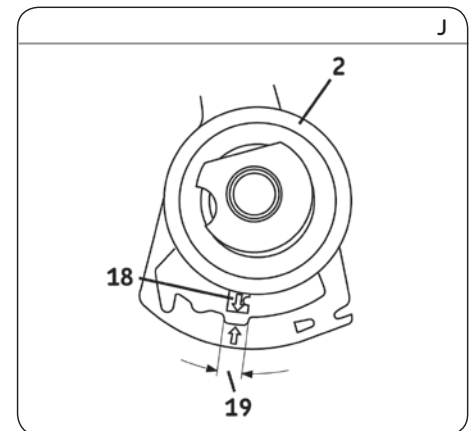
- 23) Fit the new tensioner roller (2) of the camshaft belt without tightening fully its new fastening bolt (13) and its bolt (17) (Fig. A).
- 24) Fit the new idler roller (3) without tightening fully its new fastening bolt (11) (Fig. A).
- 25) Smear oil on the camshaft fastening bolt (10) (Fig. A). Tighten the bolt manually, then loosen it by a half-turn, and check that the camshaft sprocket turns freely.
- 26) Fit the new camshaft belt (1) (Fig. A) starting with the crankshaft sprocket and according to the engine rotation direction indicated by the arrows on the belt.
- 27) Turn the plate (12) of the idler roller (3) clockwise up to the "9 o'clock" position then tighten its fastening bolt (11) to a torque 20 Nm (Fig. H).
- 28) Lock the camshaft sprocket using tool (9), then tighten the fitting bolt (10) to a torque of 20 Nm (Fig. F).
- 29) Remove the crankshaft timing pin (6) (Fig. C), the camshaft timing rule (7) (Fig. D) and the pin (8) on the injection pump sprocket (Fig. E).
- 30) Turn the crankshaft slowly by 6 turns in the engine rotation direction, until the notch on the injection pump sprocket is in the "11 o'clock" position (Fig. B) to set cylinder No.1 at TDC.
- 31) Insert the crankshaft timing pin (6) into the engine block (Fig. C). Turn the crankshaft clockwise slowly until it stops on the pin (6). Fit the timing rule (7) (Fig. D).
- 32) Lock the camshaft sprocket using tool (9), and loosen mounting bolt (10) (Fig. F). Separate the sprocket from its seat using a screwdriver and a mallet.
- 33) Loosen slightly the fastening bolt (11), then use a hex head key to turn the plate (12) (Fig. H) clockwise on the idler roller (3) until the arrow on the moving index (18) on the tensioner roller (2) is aligned on the right edge of the adjustment zone (19) (Fig. I).
- 34) In this position, tighten the bolt (11) on the idler roller (3) to 45 Nm (Fig. A). Lock the camshaft sprocket using tool (9), then tighten the fastening bolt (10) to 35 Nm for an M8 bolt or 45 Nm for an M10 bolt (Fig. F). Tighten the fastening bolt (13) of the tensioner roller (2) to 50 Nm then tighten the bolt (17) to 10 Nm (Fig. A).
- 35) Remove the timing rule (7) (Fig. D) and the crankshaft timing pin (6) (Fig. C).
- 36) Turn the crankshaft slowly by 4 turns in the engine rotations direction, until the notch on the injection pump sprocket is in the "11 o'clock" position (Fig. B) to set cylinder No.1 at TDC.
- 37) Insert the crankshaft timing pin (6) into the engine block (Fig. C). Turn the crankshaft clockwise slowly until it stops on the pin (6).



- 38) Check the adjustment of the tensioner roller (the arrow on the moving index (18) must be located in the adjustment zone (19) (Fig. J) and fit the timing rule (7) (Fig. D).

**Note:** The tension of the timing belt is correct when the arrow on the moving index (18) of the tensioner roller is inside the adjustment zone (19) (Fig. J) and the timing rule (7) enters properly the slot located at the back of the camshaft.

- 39) If the arrow on the moving index is not located in the adjustment zone and/or if the timing rule cannot be fitted, remove the new camshaft belt, and readjust tension starting from step 26).
- 40) Remove the timing rule (7) (Fig. D) and the crankshaft timing pin (6) (Fig. C).
- 41) Refit the elements removed in reverse order to removal.
- 42) Fill the cooling circuit with the permanent fluid recommended.
- 43) Check the circuit's leak-tightness when the engine reaches its running temperature and secure the level of coolant when the engine is at ambient temperature (20 °C).



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