

VKMA 95010



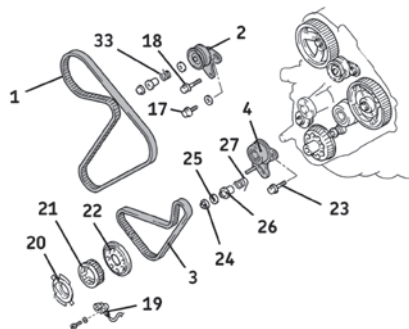
VKMA 95014



A

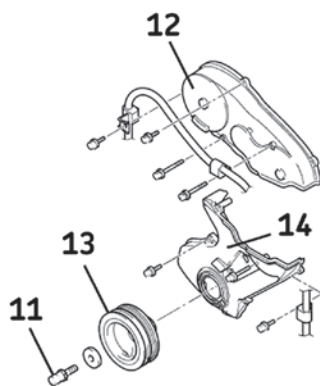


MD998721



(11): 180-190 Nm  
(12)/(14): 10-12 Nm  
(17)/(18): 23-29 Nm  
(23)/(24): 23-29 Nm

B



### Removal

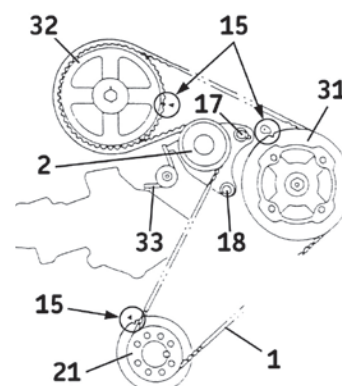
- 1) Disconnecting the battery according to the vehicle manufacturing guidelines.
- 2) Prepare the vehicle for the timing replacement according to the vehicle manufacturing guidelines.
- 3) Immobilise the crankshaft pulley (13) using the tool MD998721 and remove its fixing bolt (11) (Fig. B).
- 4) Remove the crankshaft pulley (13).
- 5) Remove the upper (12) and lower (14) timing belt covers (Fig. B).
- 6) Refit the crankshaft pulley fixing bolt (11) in order to rotate the crankshaft in a **clockwise** direction to align the timing marks (15) and (16) of timing belts (1) and (3) (Fig. C and D).
- 7) Slacken the timing belt (1) roller (2) fixing bolts (17) and (18) (Fig. E).
- 8) Tip the tensioner roller (2) in an **anti-clockwise** direction using a screwdriver (Fig. E).
- 9) Immobilise the tensioner roller (2) by temporarily tightening its bolt (17) (Fig. E).
- 10) Remove the crankshaft angle sensor (19) (Fig. A) (depending on the assembly).
- 11) Remove the crankshaft rotation detection ring (20) (depending on the assembly).
- 12) Remove the timing belt (1) (Fig. A).
- 13) Loosen the bolt (17) to release the tensioner roller (2) then remove the bolts (17), (18) and the tensioner roller (2) (Fig. E).
- 14) Slacken the bolt (23) and the nut (24) of the tensioner roller (4) for the balance shafts belt (3) (Fig. F).
- 15) Tip the tensioner roller (4) in a **clockwise** direction using a screwdriver (Fig. F).
- 16) Immobilise the tensioner roller (4) by temporarily tightening its nut (24).
- 17) Remove the belt (3) (Fig. A).
- 18) Loosen the nut (24) to release the tensioner roller (4) then remove the nut (24) (Fig. F).
- 19) Remove the gasket (25), the tension spacer (26) and the spring (27) of the tensioning roller (4) (Fig. A).
- 20) Remove the bolt (23) and the tensioner roller (4) (Fig. A).

### Refitting

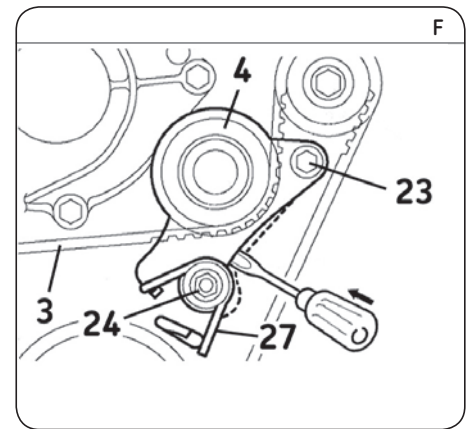
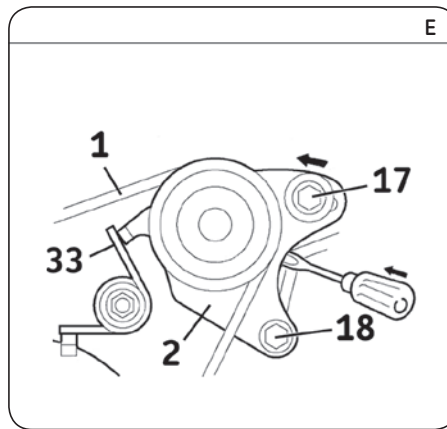
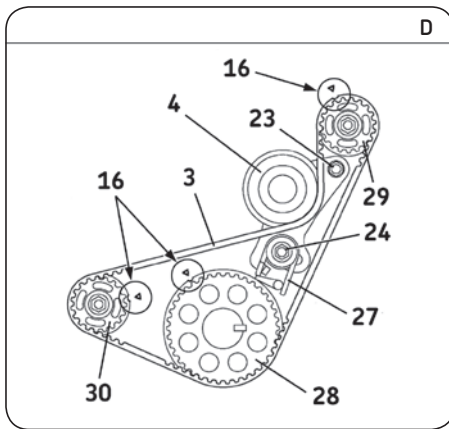
**Caution!** First carefully clean the bearing surfaces of the rollers.

- 21) Fit the new tensioner roller (4) and hand-tighten its fixing bolt (23) (Fig. F).
- 22) Refit the tension spacer (26), the spring (27) and the gasket (25) and hand-tighten the nut (24) (Fig. A).
- 23) Tip the tensioner roller (4) in a **clockwise** direction using a screwdriver (Fig. F).
- 24) Immobilise the tensioner roller (4) in this position by temporarily tightening its nut (24).
- 25) Check the alignment of the timing marks (16) for the timing belt (3) (Fig. D). Fit the new balance shafts belt (3), starting with the crankshaft sprocket (28) (Fig. D).
- 26) Support the upper balance shaft pinion (29) in order to stop the timing mark turning and engage the belt (3), taking care to correctly tension the strand located between the crankshaft sprocket and the upper balance shaft pinion (29) (Fig. D).
- 27) Support the lower balance shaft pinion (30) in order to stop the timing mark turning and engage the belt (3), taking care to correctly tension the strand located between the crankshaft sprocket (28) and the lower balance shaft sprocket (30) (Fig. D).

C



Install Confidence

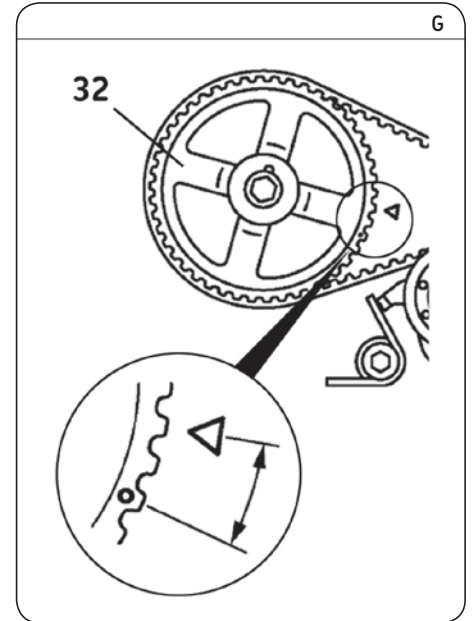


- 28) Finish by pressing on the strand of the belt located between the tensioning roller (4) and the lower balance shaft pinion by hand in order to put the belt (3) in place around the tensioning roller (4).
- 29) Check that the timing marks (16) are still aligned (Fig. D).
- 30) Slacken the nut (24) and the bolt (23) so that the spring (27) pressure can operate and allow the tensioner roller (4) to press without constraint onto the belt (3) (Fig. D).
- 31) Tighten the nut (24) and the bolt (23) to between 23 and 29 Nm by tightening the nut (24) first (if the bolt (23) is tightened first the tensioner (4) moves and slackens the belt).
- 32) Press the belt (3) with the forefinger between the crankshaft sprocket (28) and the upper balance shaft sprocket (29) to check that the deflection is between 4 and 5 mm (Fig. D).
- 33) Fit the new tensioner roller (2) for the timing belt (1) and slightly hand-tighten its bolts (17) and (18) (Fig. E).
- 34) Tip the timing belt (1) tensioner roller (2) in an anti-clockwise direction using a screwdriver (Fig. E).
- 35) Immobilise the tensioner roller (2) in this position by temporarily tightening its bolt (17) (Fig. E).
- 36) Check the alignment of the timing marks (15) for the timing belt (1) (Fig. C).
- 37) Fit the new timing belt (1) starting with the crankshaft sprocket (21).
- 38) Support the injection pump sprocket (31) in order to stop the timing mark turning and engage the timing belt (1), taking care to correctly tension the strand located between the crankshaft sprocket and the injection pump sprocket (31) (Fig. C).
- 39) Support the camshaft sprocket (32) in order to stop the timing mark turning and engage the timing belt (1), taking care to correctly tension the strand located between the injection pump sprocket and the camshaft sprocket (32) (Fig. C).

- 40) Finish fitting the belt by putting it in place around the tensioner roller (2) (Fig. C).
- 41) Slacken the screws (17) and (18) so that the spring (33) pressure can operate and allow the tensioner roller (2) to press without constraint onto the belt (1) (Fig. C).
- 42) Turn the crankshaft in a clockwise direction so that the camshaft sprocket turns by 2 teeth (Fig. G).

**Caution!** The rotation of the camshaft sprocket must not exceed 2 teeth relative to the timing mark. Do not touch the timing belt (1) during adjustment.

- 43) Tighten the bolts (17) and (18) of the tensioner roller (2) to between 23 and 29 Nm, tightening bolt (17) first (if bolt (18) is tightened first the tensioner moves and over-tightens the belt).
- 44) Turn the crankshaft in a clockwise direction by a little less than 2 turns and check that the timing belt timing markers (15) are aligned (Fig. C).
- 45) Press the timing belt (1), with the forefinger between the camshaft sprocket (28) and the injection pump to check that the deflection is between 4 and 5 mm (Fig. C).
- 46) Remove the crankshaft pulley fixing bolt (11) (Fig. B).
- 47) Refit the crankshaft rotation detection ring (20) (Fig. A) (depending on the assembly).
- 48) Refit the crankshaft angle sensor (19) (Fig. A) (depending on the assembly).
- 49) Refit the upper and lower covers (12) and (14) and tighten their fastenings to between 10 and 12 Nm.
- 50) Refit the crankshaft pulley (13) (Fig. A).
- 51) Immobilise the pulley (13) using the tool MD998721 and tighten its fixing bolt (11) to between 180 and 190 Nm.
- 52) Proceed in the reverse order to removal for the remaining operations.



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