

NT 91000

VKMA/C 91303

VKMA/C 91903

Toyota

VKMA 91303

VKMA 91903

VKMC 91303

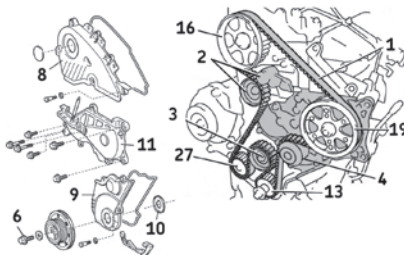
VKMC 91903



A

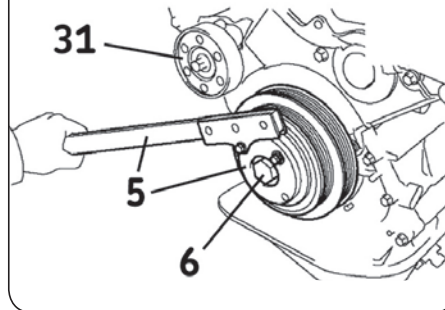


- (5): SST 09213-54015 / STT 91561-60855 / SST 09330-00021.
- (7): SST 09950-50012 / STT 09950
- 50013 / SST 09951-05010 / SST 09952-05010 / SST 09953-05010 / SST 09953-05020 / SST 09954-05021 / SST 09954-05030.
- (26): STT 09960-10010 / SST 09962-01000 / SST 09962-01400 / SST 09963-01000.



- (3): 47 Nm
(4): 31 Nm
(6): 180 Nm
(8), (9): 7,4 Nm
(11): 37 Nm / 64 Nm
(19): 103 Nm
(22): 35 Nm
(28), (29): 21 Nm
(31): 40 Nm
(32): 9 Nm

B



Removal

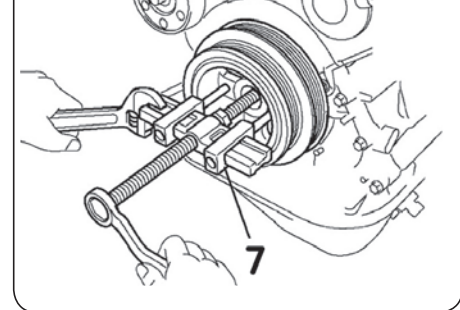
- 1) Disconnect the battery according to the vehicle manufacturing guidelines.
- 2) Prepare the vehicle for the timing replacement according to the vehicle manufacturing guidelines.
- 3) Support the crankshaft pulley using the tool (5) and remove its fixing bolt (6) (Fig. B).

Note: with tool (5) STT 91651-60855, use a washer with a thickness of 5 mm.

- 4) Remove the crankshaft pulley using the tool (7) (Fig. C).
- 5) Depending of assembly, remove the idler roller (31) of the auxiliary drive belt tensioner (Fig. B).
- 6) Remove the upper (8) and lower (9) timing covers (Fig. A).
- 7) Remove the timing belt guide washer (10) noting its fitting direction (Fig. A).
- 8) Remove the intermediate timing cover (11) (engine bracket plate) (Fig. A).
- 9) Depending of assembly, remove the timing belt guide (32) (Fig. J).
- 10) Refit the crankshaft pulley fixing bolt (6) in order to turn the crankshaft in a **clockwise** direction, to bring the piston of the No.1 cylinder to end-of-compression TDC:
 - The moving marker (12) on the crankshaft sprocket (13) is aligned with the fixed marker (14) (Fig. D),
 - The moving marker (15) on the camshaft sprocket (16) is aligned with the cylinder head mating surface (17) (Fig. E),
 - The moving marker (18) on the injection pump sprocket (19) is aligned with the fixed marker (20) (Fig. E).
- 11) Remove the belt tensioning device (21) (Fig. F).
- 12) Remove the timing belt (1) (Fig. A).

Note: Do not turn crankshaft or camshaft when timing belt is removed.

C



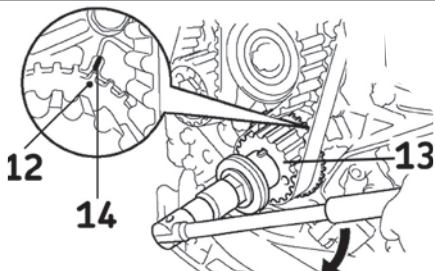
- 13) Using an 8 mm Allen key, remove the threaded shaft (22) then remove the tensioner roller (2) and the washer (23) (Fig. F).
- 14) Remove the idler roller (3) (Fig. A).
- 15) Check the condition of the tensioning device (21) when it is not included in the kit (Kits VKMA/VKMS/VKMC 91303 -VKMC 91303-2):
 - Only a very slight trace of oil is acceptable at the thrust rod side (24); the presence of any other oil leaks mean that the tensioning device (21) must be replaced (Fig. F).
 - Check that the height between the upper flange of the tensioning device and the end of the thrust rod (24) (Fig. F) is between 9 and 10.6 mm: if this is not the case then replace the tensioning device (21).
 - Press the tensioning device (21), by hand, against a workbench or other flat surface: if the rod (24) (Fig. F) moves replace the tensioner.

Note: SKF recommends changing the tensioning device every time the tensioner and idler are replaced.

Caution: Never hold the tensioning device (21) with the thrust rod side (24) pointing downwards.

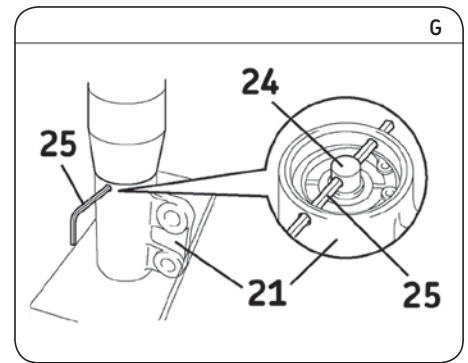
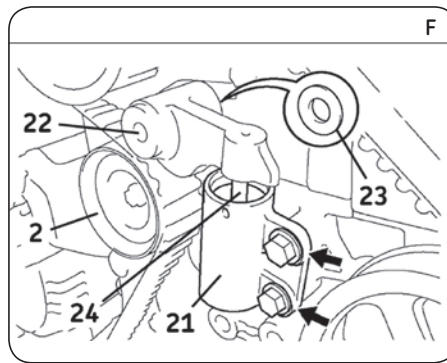
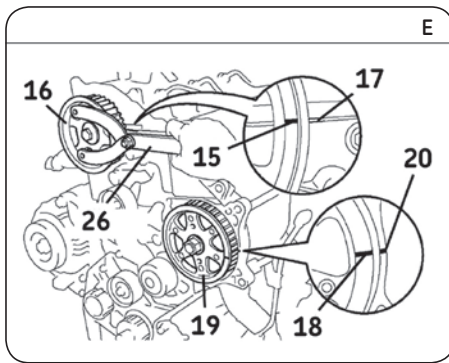
- 16) **Removing the water pump (VKMC 91303 / VKMC 91303-2 / VKMC 91903 / VKMC 91903-2):**
 - Bleed the cooling circuit, check it is clean, and clean if required.
 - Support the injection pump sprocket (19) (Fig. A) using the tool (26) (Fig. E) and remove its fixing bolt.
 - Remove the injection pump sprocket (19) using the tool (7) (Fig. C).
 - Remove the 7 fitting bolts on the water pump (4) (Fig. I).
 - Remove the water pump (4) and its seal

D



Install Confidence





Refitting

Caution! First of all clean the bearing surfaces of the roller wheels carefully.

17) Refitting the water pump:

- Fit the new water pump (4) with its new seal and apply the torque **31 Nm** to its 7 bolts (Fig. I).
- Check that the water pump pulley runs properly and has no hard or locking spots.
- Refit the injection pump sprocket (19) and use the tool (26) (Fig. E) to immobilise it whilst tightening its retaining bolt to **103 Nm**.

18) When re-using the tensioning device (21)

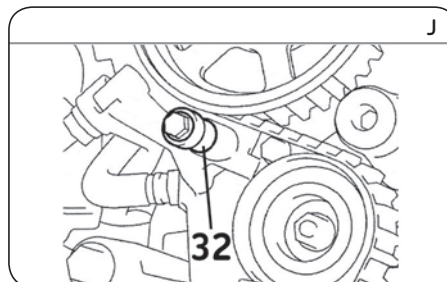
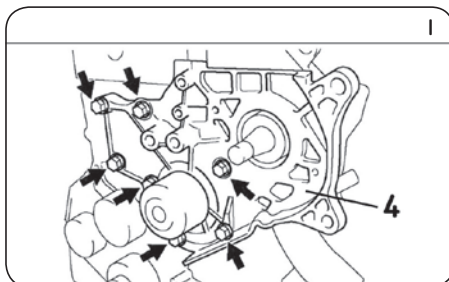
- (kits VKMA/VKMS/VKMC 91303 - VKMC 91303-2):
- Slowly exert pressure on the rod (24) using a press (Fig. G).
- Align the holes in the tensioning device (21) and the rod (24) then insert a 1.27 mm diameter pin (25) (a drill bit, for example) (Fig. G).

Note: This operation should be carried out in a vertical position only!

- 19) Fit the new idler roller (3) and tighten its fastening bolt to **47 Nm** (Fig. A).
- 20) Fit the new tensioner roller (2), the washer (23) and the threaded shaft (22) (Fig. F).
- 21) Using an 8 mm Allen key tighten the threaded shaft (22) to **35 Nm** (Fig. F).
- 22) Check the alignment of the timing marks (Fig. D and E) (to prevent misalignment of the camshaft sprockets (16) and/or injection pump sprockets (19), adjust the position of the sprockets using tool (26) (Fig. E)).
- 23) Fit the new timing belt (1), ensuring the correct direction of rotation, in the following order (Fig. A): camshaft sprocket (16), injection pump sprocket (19), water pump (4), crankshaft sprocket (13), idler roller (3), oil pump sprocket (27) and tensioner roller (2).

Note: When fitting the belt (1), take care to ensure that the timing marks are not moved.

- 24) Refit the tensioning device (21) (new device (21) for kits VKMA/VKMC 91903 - VKMC 91903-2) starting with its lower bolt (28) and turn it in a **clockwise** direction in order to fit its upper bolt (29) (Fig. H).

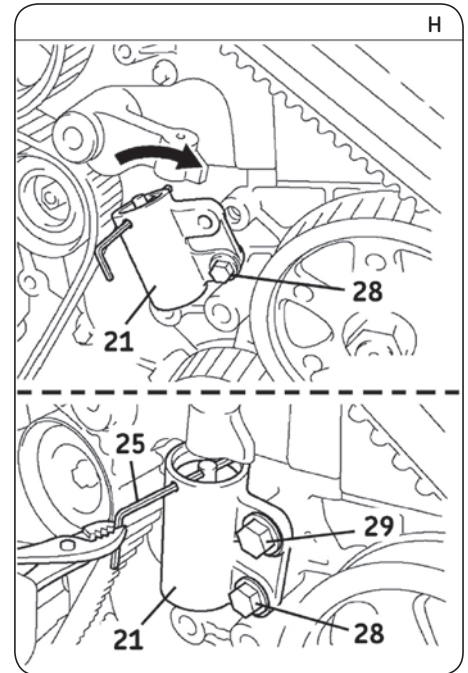


- 25) Tighten bolts (28) and (29) to **21 Nm**.
- 26) Remove the immobilisation pin (25) using a plier (Fig. H), or the SKF pin (kits VKMA/VKMC 91903 - VKMC 91903-2) by hand, and allow the tensioning device (21) to operate.
- 27) Rotate the crankshaft twice and return to the point where the marks (12) and (14) located on the crankshaft sprocket (13) and on the oil pump are in alignment (Fig. D).
- 28) Check:
 - That the moving marker (15) on the camshaft sprocket (16) is aligned with the cylinder head mating surface (17) (Fig. E).
 - The moving marker (18) on the injection pump sprocket (19) is aligned with the fixed marker (20) (Fig. E).

Note: If the timing marks are incorrectly aligned, remove the tensioning device (21) then the timing belt (1). Follow directions in step 18 for compressing the tensioning device.

Caution: Do not attempt to use item (2) (Fig. F) to compress the hydraulic tensioner! Then re-commence the belt tensioning procedure starting from step 22.

- 29) Depending of assembly, refit the timing belt guide (32) and tighten its screw to **9 Nm** (Fig. J).
- 30) Refit the intermediate timing cover (11) (engine support bracket plate) and tighten its fixing bolts to **37 Nm** (14 mm head) and to **64 Nm** (17 mm head) (Fig. A).
- 31) Remove the fixing bolt (6) from the crankshaft pulley (Fig. A).
- 32) Refit the timing belt guide washer (10) (Fig. A).
- 33) Refit the lower (9) and upper (8) timing covers (after checking the condition of their seal) and tighten their fixing bolts to **7.4 Nm** (Fig. A).
- 34) Depending of assembly, refit the roller (31) of the auxiliary drive belt tensioner and tighten its fixing screw to **40 Nm** (Fig. B).
- 35) Refit the crankshaft pulley and support it using the tool (5) to tighten its fixing screw (6) to **180 Nm** (Fig. B).
- 36) Refit the elements removed in reverse order to removal.
- 37) Fill the cooling circuit with the permanent fluid recommended.



- 38) 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).

Notice: Always follow the vehicle manufacturer instructions when working on the engine. The SKF KITS are designed for the automotive repair professional and must be fitted using tooling used by these professionals. These instructions are to be used as a guideline only. This document is the exclusive property of SKF. Any representation, partial or full reproduction, is forbidden without prior written consent from SKF.