Accurate guidelines for longer engine life

Many technicians are taking chances by not following all the manufacturer recommendations which can lead to issues with broken parts or damage to the engine. This bulletin covers some important fitting procedures in order to eliminate the risks of engine damage on this particular application.

This engine comes with two belt systems and care must be taken when replacing them. Any deviation to the settings or not replacing the stretch bolts and studs could have a catastrophic effect on the life of the engine. The photos used in this bulletin were taken of a VW Transporter. This 2.5 TDI engine fits many different applications. Please check the vehicle manufacturer recommendations when working on this engine.

VW recommends the use of the following tools:
(A) Camshaft gear retaining tool: No. 3036
(B) Camshaft locking bar: No. 2065A
(C) Tensioner adjustment spanner: No. 3355
(D) Crankshaft retaining tool: No. 3248/A

Care should be taken when determining what kit should be fitted because the timing tensioners inside the two individual kits look similar. Beware: They each contain individual internal structures with different spring force and strength!

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<th>VW TRANSPORTER IV 2.5 TDI 100</th>
<th>VKM 11072</th>
<th>VKM 11257</th>
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<tbody>
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Vehicle applications – VKMC 01270, VKMC 01258-1, VKMC 01258-2*

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<thead>
<tr>
<th>CAR MAKER</th>
<th>MODEL</th>
<th>ENGINE</th>
<th>ENGINE CODE</th>
</tr>
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<tbody>
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<td>VOLVO</td>
<td>850, 850 Estate, S70, S80 i, V70 i, V70 ii</td>
<td>2.5 TDI</td>
<td>D 5252 T</td>
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<td>VW</td>
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<td>2.5 SDI, 2.5 TDI</td>
<td>ACV, AGX, AHD, AHY, AJT, ANJ, APA, AUF, AVR, AXG, AXL, AYC, AYY, BBE, BBF</td>
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*VKMC 01258-2 fitted on only Volvo as above. This kit includes the same tensioners and has the same manufacturer recommendations, but has a different water pump design.

Setting guide for VW Transporter 2.5 TDI engine

Prepare the vehicle as set out in the manufacturer recommendations. Drain and discard the old cooling liquid. In any order, remove the:

- a. Timing belt upper cover
- b. Cylinder head cover
- c. Injection belt pump cover

1. Using the tool specified by VW, loosen the crankshaft retaining bolt. **Caution:** this bolt is torqued to 160 Nm + 180 degrees (1/2 turn).

2. Rotate the engine until the flywheel timing mark is aligned as shown.

3. Check that the injection pump is aligned as shown. If not, rotate the engine another 360 degrees.
4. Remove the injection pump camshaft pulley, belt and tensioners. Use the retaining tool to avoid twisting the camshaft whilst loosening the retaining bolts!

5. If the timing is set correctly and the alignment slots for the locking tool is as below, fit the locking tool as specified by VW.

6. Remove the crankshaft pulley and timing system lower cover. Loosen the tensioner and remove the belt.

7. Remove camshaft timing gear. Caution: the VW retaining tool must be used.

Remember: the camshaft is locked at the injection pump side of the engine. When attempting to remove the bolt, a twisting force is applied to the camshaft. This force will cause micro-fractures to the camshaft material, thus weakening the metal structure. In time, this could cause camshaft breakage, thus destroying the engine!

(Universal camshaft retaining tools can be purchased from various good tooling manufacturers.)
8. Remove old pump. Clean area using sandpaper only. This coolant pump has an “O-ring” type seal fitted, and generally it does not require any paste. If the engine is old, and this is not the first time the coolant pump has been changed, there might be some abrasions on the cylinder block due to metal scrapers being used in the previous cleaning. In this case, a small amount of silicone paste could be used – though not always necessary.

Apply paste to the outer edge of the “O-ring” only! If any paste gets into the coolant area of the pump, it could be transferred to the seal, thus causing damage and leakage!

9. Fit the new VKPC 86619 and torque the exposed bolts to 15 Nm. The other bolts are not fitted and torqued until the lower timing cover is replaced.

When renewing the cooling system components, always ensure that the engine and radiators are completely flushed with clean water. Any remaining residue i.e metal particles, calcium deposits, etc. can destroy the seal in the new water pump!

10. VKM 11072, VKM 11257. Fit the tensioner, ensuring that it is correctly placed onto the pin. Finger tighten to ensure placement.
11. Setting the tension of the timing system: the technician must remember that there are no locking devices on the crankshaft, and it is only the camshaft that is retained in the correct position. Thus the camshaft gear must rotate whilst tensioning the system.

Starting with the coolant pump, fit the belt in an anticlockwise direction.

Using the correct tool, rotate the adjuster in a clockwise direction until the pointer is aligned with the centre of the backing plate. Check that the camshaft gear is rotating whilst setting the tension. If it is not, then the correct tension will not be maintained, and damage to the engine could occur. Torque the tensioner to 20 Nm. Recheck your alignment marks.

12. Torque the camshaft timing gear using the below guidelines.

- 10.9 bolt = 100 Nm.
- 8.8 bolt = 85 Nm.

USE retaining tool whilst the torque is applied!
13. Refit lower belt cover, (torque the coolant pump bolts to **20 Nm**). It is recommended at this stage to replace the crankshaft damper, as many auxiliary belt system failures are related to worn/old vibration dampers. Fit the VKM 93107 vibration damper. Use the new bolts supplied in the SKF kit. The large retaining bolt should be torqued to **160 Nm + 180 degrees** and the four small retaining bolts to **20 Nm**.

14. Injection pump belt system: when replacing the injection system there are two important recommendations from VW that the technician should follow. **Always** replace the stretch stud for the VKM 11258, as many engine failures are due to this stud snapping. Fit and torque to manufacturers recommendations. Locate the tensioner correctly, finger tighten the new nut and rotate clockwise until the pointer is aligned with the edge of the cylinder head. **Torque to 20 Nm.** Recheck your adjustment.
15. Fit the new VKM 11073 (utilizing the new washer and bolt) and ensure that the tensioner is located correctly. Remove the camshaft locking tool and use a **new** camshaft bolt. Reinstall the camshaft gear and finger tighten the retaining bolt.

16. Ensure tensioner is positioned at “10 o’clock position” and refit the belt. Rotate the tensioner in an anti-clockwise direction, until the pointer on the adjusting plate is aligned with the arrow on the backing plate. **Torque to 15 Nm.** Recheck your setting.

17. Torque the camshaft gear to **160 Nm.** Once again, use the retaining tool! Rotate the engine through two complete revolutions, and recheck your settings on both tensioners.
18. This is one of the few engines on which you can reset the tensioners without removing the belts. *This is not always the case for all engines.*

On the timing side of the engine, if the pointers are not aligned, slightly loosen the retaining nut and in a clockwise rotation align the pointers as described in section 11. Re-torque to 20 Nm.

Do not exceed the marking on the backing plate, as damage will occur to the internal spring!

The same adjustment procedure can be used for the injection pump side of the engine.

Lightly loosen the tensioner retaining nut and rotate anti-clockwise to align the pointers. Re-torque to 20 Nm.

If the above procedures are not followed the tensioners will be destroyed, and with this being an interference engine, damage to the engine will occur.

Refit the covers, and the auxiliary system using a new belt. Refill the cooling system with the correct mixture of coolant and bleed the engine as per the manufacturer recommendations.