PRODUCT TECHNICAL INFORMATION

SUBJECT

Engine DW 10 F
Engine DW 12 R

PRODUCTS DESIGNATIONS

VKMC 03317
VKMA 03317, VKPC 83646

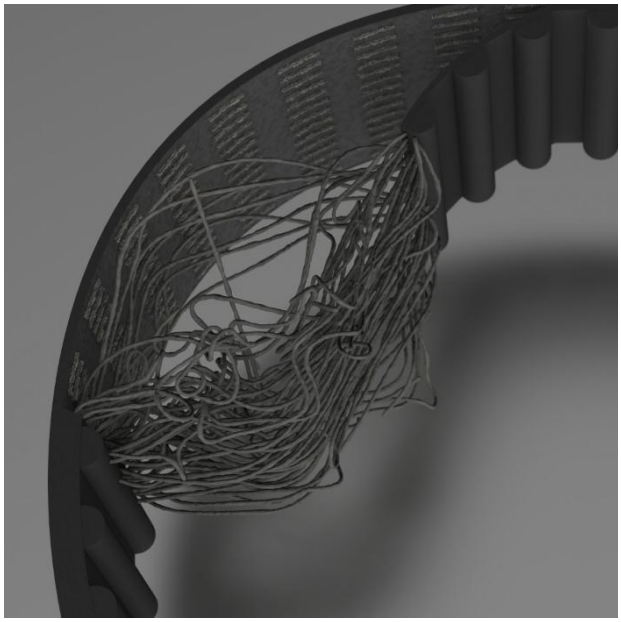
CAR MANUFACTURERS - BRANDS

Citroen, Ford, Opel, Peugeot, Toyota, Vauxhall
Engines DW 10 F and DW 12 R

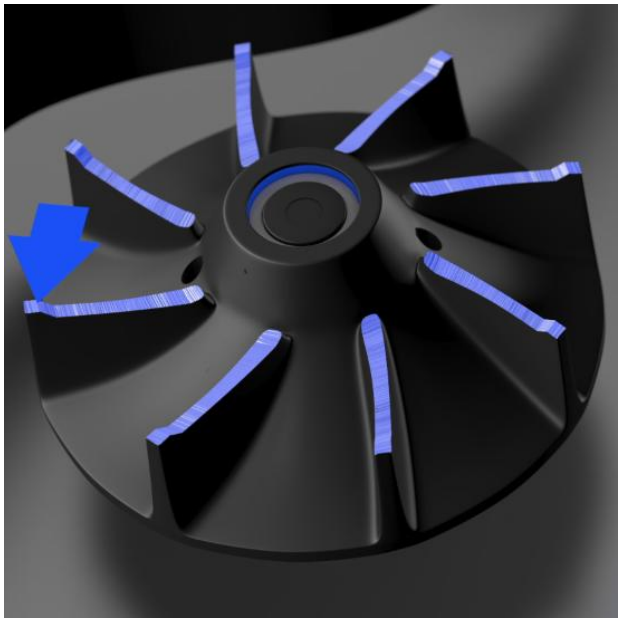
SKF Kit	OE number (equivalency)
VKMC 03317	PSA = 16 102 782 80 – 16 133 279 80 Fiat = 155253408
VKMA 03317	PSA = 16 090 909 80, 0830.51, 0830.72, 0830.74, 0816.K5, 0816.K8, 16 090 868 80, 0516.A4, 0516.60 FIAT = 155253402, 9400830509, 9400830749, 9634848980 Opel = 3553087, 3553073, 3553131
VKPC 83646	PSA = 1201.H7, 1201.J6, 16 102 780 80 FIAT = 155253407, 1610278080, 9684319880 Ford = 1559259, 1538412, 1427914

Case study DW 10 F and DW 12 R engines

We have investigated a number of complaints where the coolant pump impeller has moved on the shaft scratching the coolant pump housing, or where the timing belt teeth have partially sheared off.



Belt teeth partially sheared off.



Impeller wheel on the shaft displaced, vanes ground off.

After the timing belt or coolant pump has been replaced, it breaks, or the engine suffers damage after only a short time. The cause is found to be a partially sheared timing belt or a defective coolant pump. In some cases, work was also carried out on the cylinder head during the same repair (e.g. changing the cylinder head gasket).

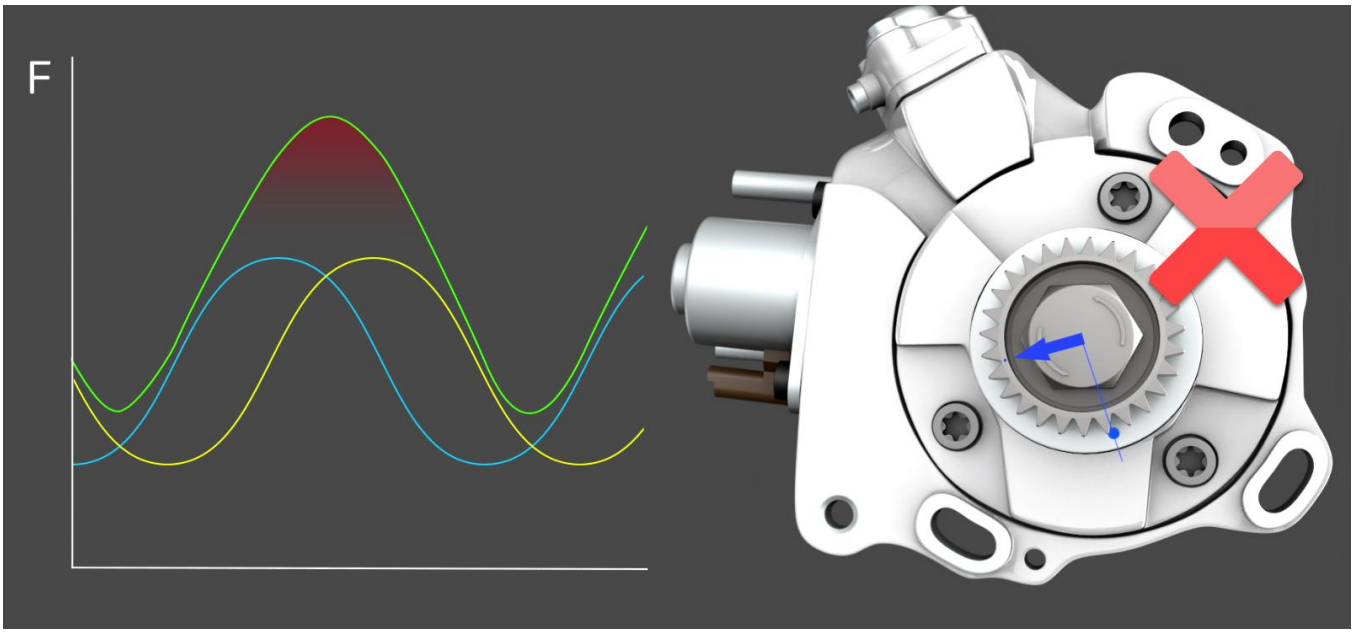
This can be caused by two independent factors:

1. Incorrect adjustment of the high-pressure fuel pump.
2. Incorrect adjustment of the timing belt.

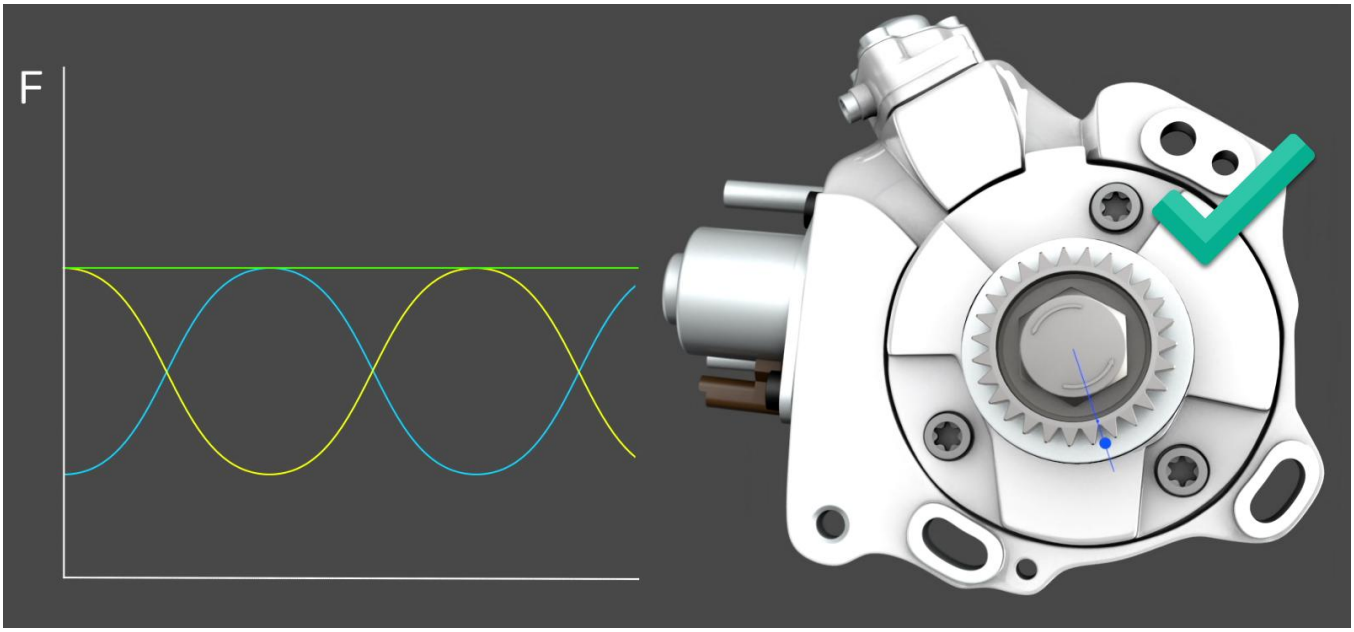
Avoiding adjustment errors of the high-pressure fuel pump

Note: It is mandatory to follow the installation steps exactly!

In modern four-stroke engines, various methods are used to improve the efficiency of the combustion process. Small and lightweight single-piston high-pressure pumps are increasingly being used in place of older multi-piston pumps. These generate fuel pressure continuously, but it is essential that these pumps are synchronised with the combustion engine.
This ensures that the torque requirement of the high-pressure pump is optimally matched to the torque requirement of the combustion engine. If this adjustment is not carried out correctly, the overall vibrations of the engine increase, which leads to an overload of the components in the belt drive. If the synchronization is set correctly, the vibrations of the engine almost cancel out the vibrations of the high-pressure pump.



There are markings on the gear wheel and the housing of the high-pressure pump which are aligned with each other when correctly adjusted. If these markings are not aligned in the setting position of the engine, the vibrations of the combustion engine and the high-pressure pump add up, resulting in increased overall vibration of the timing belt drive.



If the markings are on exactly the same level, the pump is correctly synchronized with the combustion engine and the oscillations balance each other out so that the overall oscillation is permanently within tolerance.

Note: Both the cylinder head and the camshaft sprocket have 2 different bores for locking. Depending on the job, the appropriate locking position and the appropriate special tool must be selected.

Timing belt / TDC:
Slotted hole in 4 o'clock position

High pressure pump setting:
Small hole in 6 o'clock position

However, even with a correct setting of the high-pressure pump, there is still a risk to make a failure in the mounting process which can lead to the same or similar failure pictures. To ensure the correct timing belt set-up, please follow the mounting instructions. In the following section we explain about the potential risks.

Avoiding adjustment errors during installation

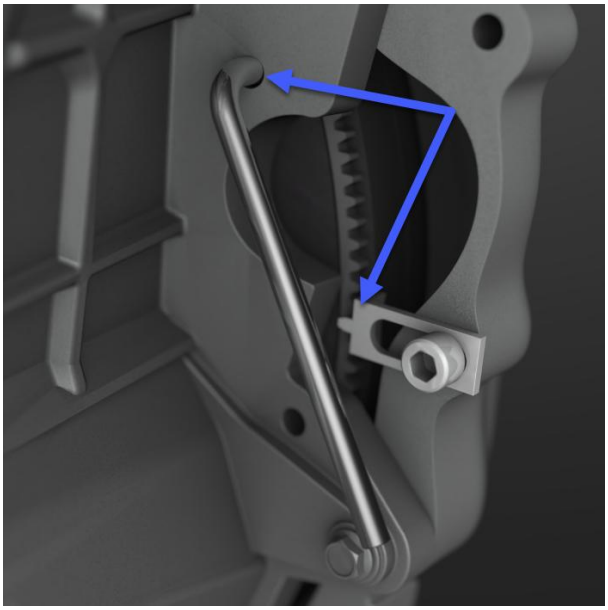
Note: It is mandatory to follow the installation steps exactly!

Exactly the same problem can of course also be caused by incorrect adjustment of the timing drive. The timing belt kits described here can be installed in various engines from different vehicle manufacturers. Depending on the vehicle manufacturer, there may be different requirements with regards to installation. It is therefore essential to always follow the vehicle-specific installation instructions exactly.

The mandatory steps for the tensioning process are explained on the following sides.
You can also see the complete installation procedure on our YouTube channel, just click here.

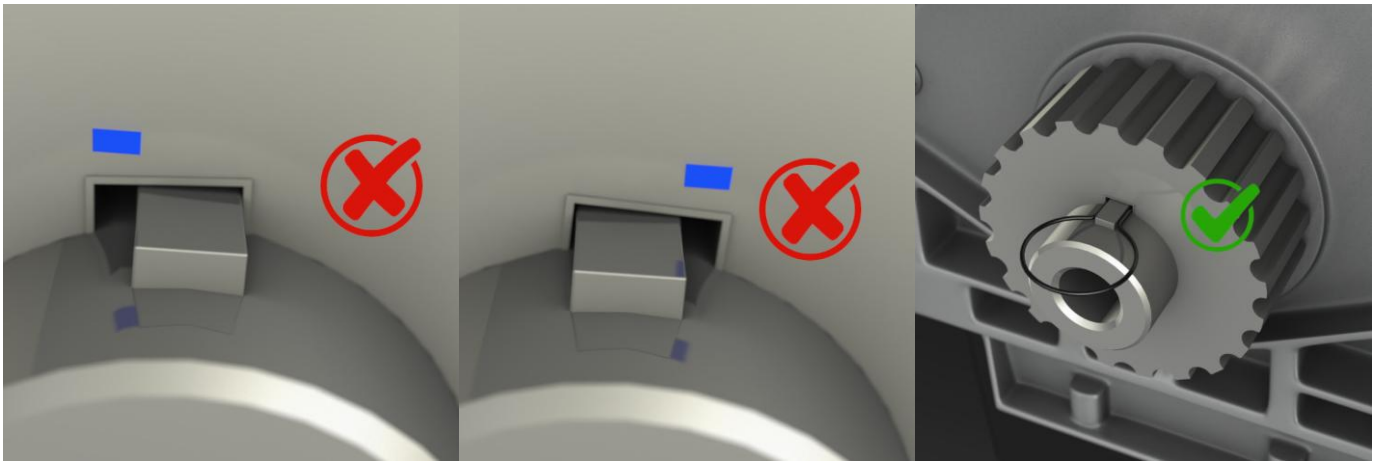
For the correct mounting ensure that camshaft and crankshaft is locked correctly:

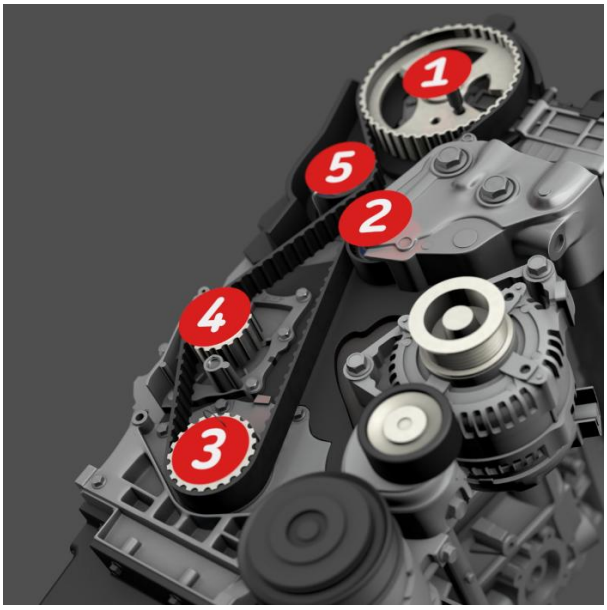
Camshaft and camshaft sprocket locked
Slotted hole in 4 o'clock position

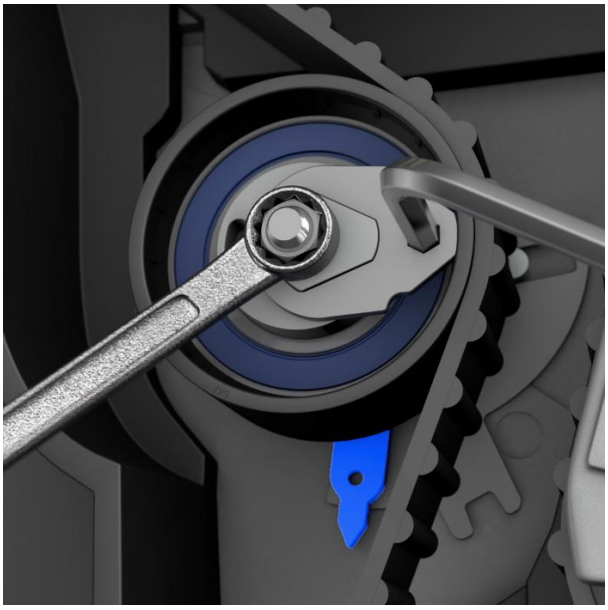


Crankshaft blocked via flywheel

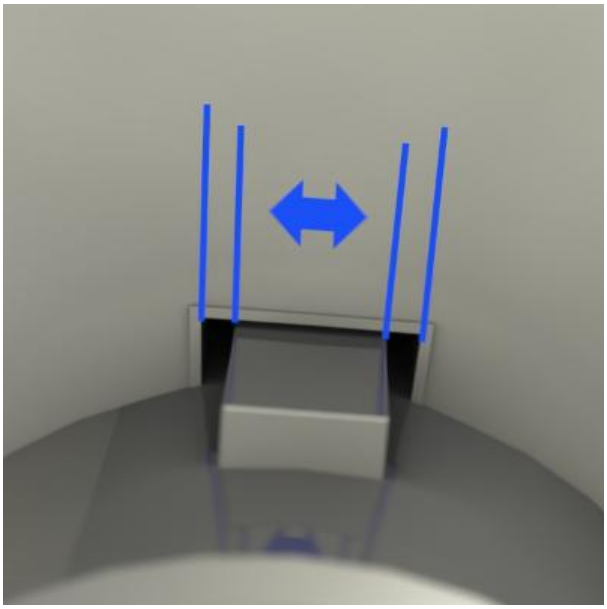
The crankshaft sprocket can be turned on the crankshaft within a certain range. It is particularly important to observe the specifications in the installation instructions. Some vehicle manufacturers use a clamp to centre the gear (see image). However, even without the use of the clamp, it is always important to ensure that the crankshaft sprocket does not rest against the stop of the twisting range when fitting the timing belt.

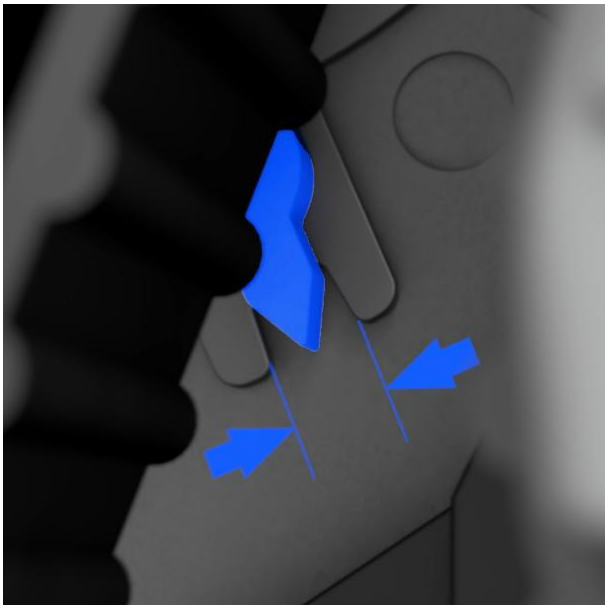






Fit the toothed belt in the specified order and twist the tensioning pulley to maximum tension. Fasten the tensioning pulley and remove all blocking tools. Make sure that the crankshaft sprocket has air in both directions.





Fit the vibration damper and turn the engine on the crankshaft screw 4 x complete turns. Re-insert the locking tools and remove the vibration damper again. Loosen the tensioning pulley, turn it to the end position and tighten it with tightening torque.

Remove all blocking tools and reinstall all components

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