SKF Pole Position

FORD

Issue 10 · 2011

VKMA 04108

Crucial setup for a simple timing belt kit

This bulletin highlights some hints and tips to avoid costly mistakes when installing this timing belt kit, on the below listed Ford applications.

The VKMA 04108 is a very simple looking timing belt kit compared to others that are on the market. It consists of one timing belt (91X20 HSN), one tensioner (VKM 14108) and one set of fitting instructions that are specific to this application.

Many garage technicians forget to do a few simple operations, which are crucial in the setting up of this timing system. One particular area of focus is the injection pump!

Vehicle applications – VKMA 04108

CAR MAKER	MODEL	ENGINE	ENGINE CODE
FORD	C-MAX	1.8 TDCi	Duratorq
	FIESTA IV	1.8 DI	LD18 Lynx
	FOCUS I	1.8 DI / TDCi / TDDi	LD18 Lynx
	FOCUS II	1.8 TDCi	LD18 Lynx
	FOCUS C-MAX	1.8 TDCi	LD18 Lynx
	GALAXY II	1.8 TDCi	LD18 Lynx
	MONDEO IV	1.8 TDCi	LD18 Lynx
	S-MAX	1.8 TDCi	LD18 Lynx
	TOURNEO CONNECT / TRANSIT CONNECT	1.8 Di / TDCi	LD18 Lynx

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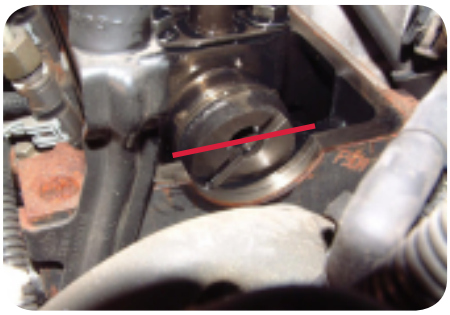
Prepare the engine as set out in the vehicle manufacturer instructions.

1. Firstly, READ the fitting instructions! Then, safely support the engine and remove the right-hand engine mount.

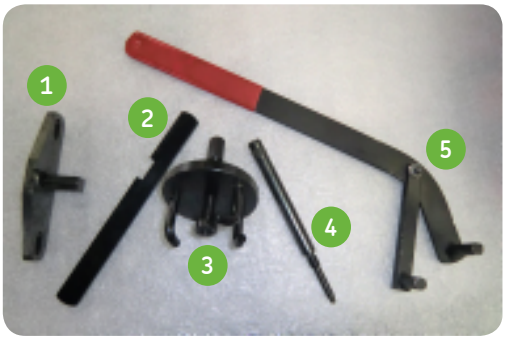


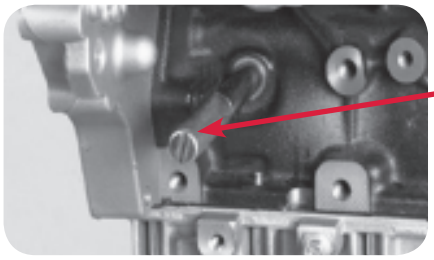
2. Remove the engine cover, turn the crankshaft clockwise and stop just before the TDC on Cylinder #1.
Important: Check that the slot on the camshaft is parallel to the edge of the cylinder head.

As with the majority of vehicle manufacturers, specific tools are required to setup this timing system. Ford recommends the following tools:

1. Flywheel locking tool (FORD 21-168 (No. 303-393))
2. Camshaft timing tool (FORD 21-162B (No. 303-376))
3. Camshaft gear puller (FORD 21-229 (No. 303-651))
4. TDC timing pin (FORD 21-104 (No. 303-193))
5. Locking tool for camshaft gear (FORD 15-030A (No. 205-072))

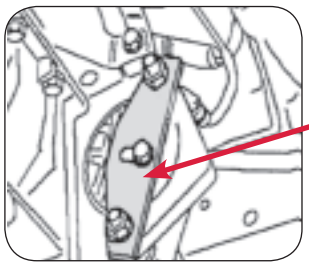
There are various tooling manufacturers – please use your preferred supplier when selecting these tools.





3. Remove the blanking plug from the block and install the TDC timing pin (tool 4).

SLOWLY rotate the crankshaft CLOCKWISE, until it stops on the timing pin.
CAUTION: Care is needed as the pin could break if too much force is applied!

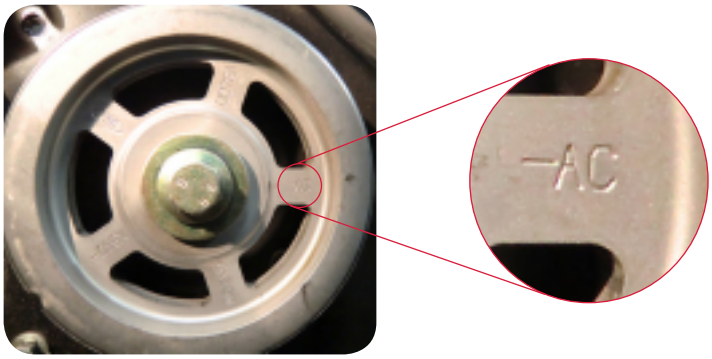


4. Then lock the flywheel using the flywheel locking tool (tool 1).

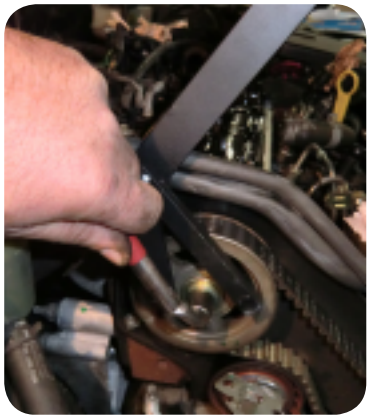
5. Fit the camshaft timing tool (tool 2).

Caution: Do not force this tool or rotate the engine whilst still fitted!

The technician can then either slacken the tensioner, then remove the tensioner and belt, or if the vehicle was manufactured before August 2000, there is a possibility that the vehicle has a manual setting timing system. To determine this, please inspect the camshaft gear, and if it is stamped with an 'AB' then the camshaft gear must be replaced with one that is stamped with 'AC' as shown below.

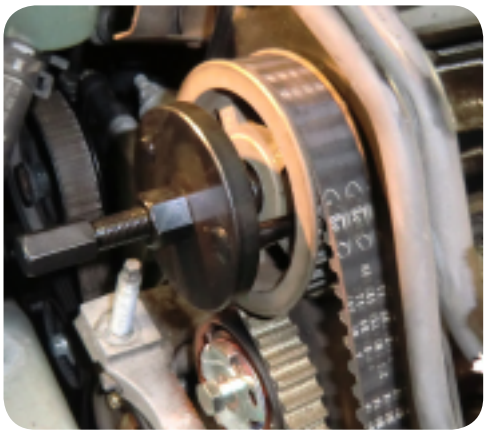


6. Using the locking tool for the camshaft gear (tool 5) – hold the cam gear and remove the retaining bolt. The use of this tool is important in the removal and the final torque of the timing gear. If the technician does not utilise this tool, taking into account that the camshaft is locked at the opposite end, a twisting force is applied during the torquing procedure and micro-fractures could occur in the camshaft. This considerably weakens the camshaft and in time will cause it to fracture, damaging the engine. The technician/garage must weigh up the difference between the cost of this tool, OR the cost of a replacement engine!



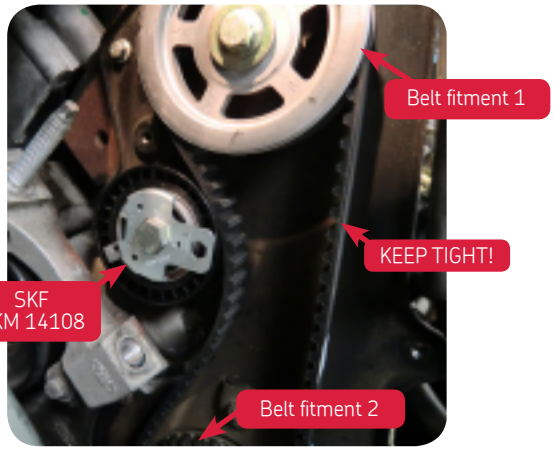
7. Fit the camshaft gear puller (tool 3) and tighten until the gear releases from the shaft.

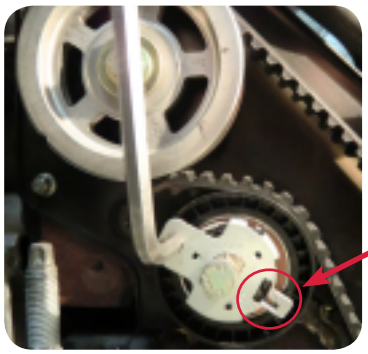
Caution: when the gear loosens, there will be a loud 'cracking' noise.



8. Fit the new 'AC' gear (if required) and finger tighten the nut, then back off 1/8th of a turn. Ensure the gear rotates freely, as the camshaft gear MUST rotate whilst setting the tension. Fit VKM 14108 and finger tighten the retaining nut. Fit the belt, (91x20 HSN) first to the camshaft sprocket and then onto the injection pump gear (the tensioner is last).

Note: Keep the belt tight on the long span (between the camshaft and the injection pump sprocket). The tensioner MUST be fitted at the '3 o'clock position' as shown in the picture!

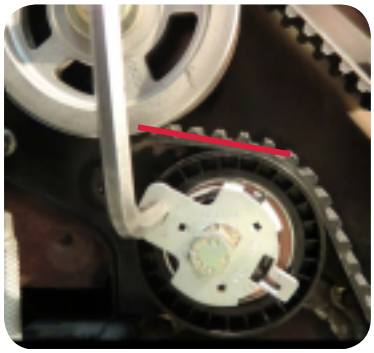




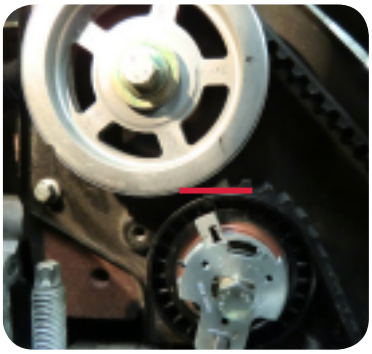
9. At the '3 o'clock position', turn the tensioner in the direction of the arrow (anti-clockwise), until the pointer is in the centre of the adjusting plate.

Torque the tensioner to 50 Nm.

By rotating in the wrong direction (or over tensioning), the incorrect wrap angle will be set.
If the engine is run in this state, the belt and tensioner will be destroyed.



Correct tension
= correct wrap angle.



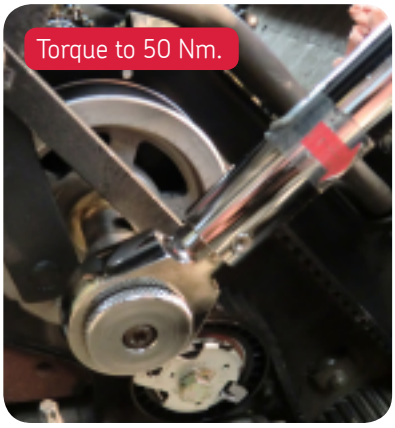
Rotation in wrong direction
= incorrect wrap angle.

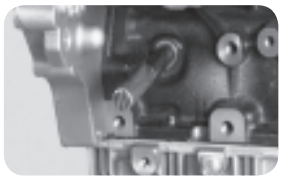
Over tensioned
= incorrect wrap angle.

WARNING: The injection pump should NOT be rotated!

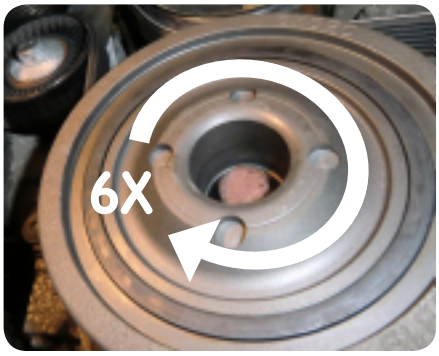
The physical connection between the crankshaft and the injection pump is driven by a chain. As all technicians know, chains will slacken over their lifetime. If the injection pump gear rotates, this could affect the power and timing of the engine. However, this could also show that the camshaft gear is not rotating whilst the tension is being set!

10. Using the camshaft gear retaining tool – torque the camshaft gear to 50 Nm.





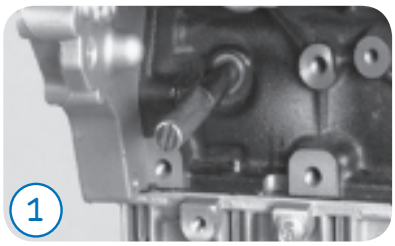
11. Remove all of the locking tools and rotate the engine in a clockwise rotation 6 times.

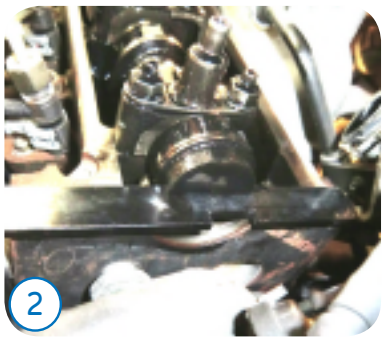


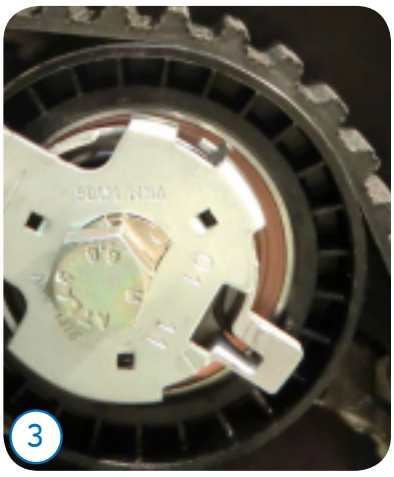
Final check

Rotate the engine in a clockwise direction and stop just before TDC on the #1 Cylinder.

1. Install the crankshaft locking pin and SLOWLY rotate the crankshaft in a clockwise direction, until it stops on the retaining pin. **Caution**: Care is needed as the pin could break if too much force is applied!
2. The camshaft locking plate should slide in with no resistance.
3. The tensioner should be set as shown!







If the tensioner is not set as shown – the technician **MUST start the procedure again at step number 9** ensuring that the camshaft gear is loose and the correct procedures are followed.

On a Ford Focus;

If the fitting of a new 'AC' type camshaft gear is required ensure that the timing cover is trimmed as shown, as the new gear has a larger diameter than the old 'AB' marked gear. By not trimming the plastic, the belt will rub on the timing cover, eventually destroying the belt.

Refit all of the removed components in the reverse order. Fit a new gasket to the rocker cover and torque to 24 Nm (as per the vehicle manufacturers instructions).

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