

Instructions for:

PETROL ENGINE TWIN CAMSHAFT & DIESEL ENGINE SETTING / LOCKING TOOL KIT

Model No: **VS4960**

Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.



IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS AND CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.



WARNING! Incorrect or out of phase camshaft timing can result in contact between valve head and piston crown causing damage to the engine.

IMPORTANT: These instructions are provided as a guide only. Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data.

WARNING: The warnings, cautions and instructions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood that common sense and caution are factors which cannot be built into this product, but must be applied by the operator.

2. INTRODUCTION / APPLICATIONS

The VS4960 Twin Cam Engine Setting / Locking Tool Kit covers engine timing and belt replacement applications on the latest range of Renault 1.4, 1.6, 1.8 and 2.0 16 valve petrol engines and 1.5dCi diesel engines.

RENAULT

Clio	Modus	Megane / Scenic
Laguna	Kangoo	

Engine codes:

K4J, K4M 1.4, 1.6 16v. engines

Clio Sport	Megane / Scenic	Laguna
Espace		

Engine codes:

F4P, F4R 1.8, 2.0 16v. engines

Clio	Modus	Megane / Scenic
Kangoo		

Engine codes:

K9K 1.5dCi diesel engines

NISSAN

Micra	Note	Almera
Kurbistar		

Engine codes:

K9K 1.5dCi diesel engines

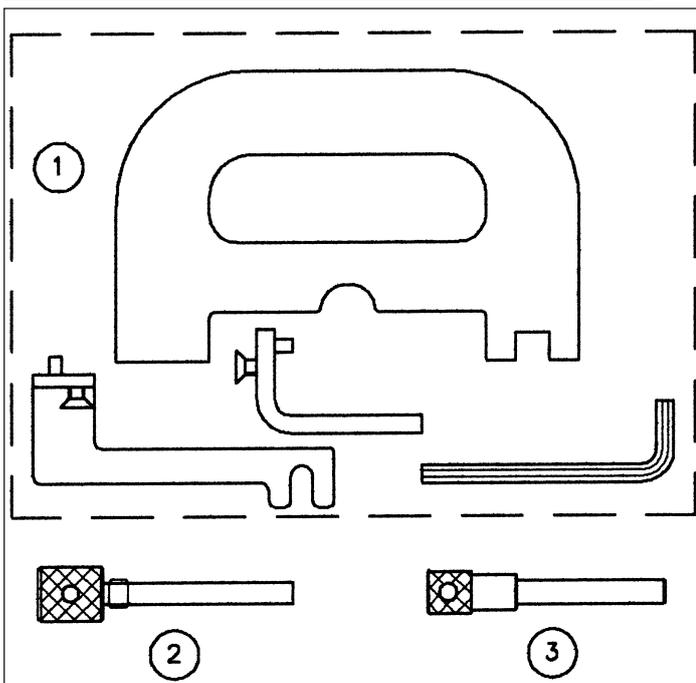
Associated Tool
VS4623



1. SAFETY INSTRUCTIONS

- WARNING!** Ensure Health and Safety, local authority and general workshop practice regulations are adhered to when using tools.
- DO NOT** use tools if damaged.
- ✓ Maintain tools in good and clean condition for best and safest performance.
- ✓ Ensure that a vehicle which has been jacked up is adequately supported with axle stands.
- ✓ Wear approved eye protection. A full range of personal safety equipment is available from your Sealey dealer.
- ✓ Wear suitable clothing to avoid snagging. Do not wear jewellery and tie back long hair.
- ✓ Account for all tools, locking bolts, pins and parts being used and do not leave them in or near the engine.

3. CONTENTS



- 1 VS4561A Camshaft Setting Plate Set c/w Brackets
- 2 VS4562A Crankshaft Locking Pin
- 3 VS125/R1 Crankshaft Locking Pin
- VS4960/84 Case + Insert

4. INSTRUCTIONS

VS4960 Twin Camshaft Engine Setting / Locking Tool Kit

The VS4960 Twin Cam Engine Setting / Locking Tool Kit covers engine timing and belt replacement applications on the latest range of Renault 1.4, 1.6, 1.8 and 2.0 16 valve petrol engines and 1.5dCi diesel engines.

The VS4561A Camshaft Setting Plate Set is used on both the K4J / K4M and F4P / F4R engines. It includes the two location brackets required to cover the range of K4J / K4M engine variants. These brackets allow the Setting Plate to be secured correctly to the engine.

Some K4J / K4M encountered will have a camshaft position sensor and therefore the Location Bracket Ref: VS4563 (included in the Set) will be required to attach the camshaft Setting Plate on these engines. The Setting Plate locates into slots at the rear of the camshafts.

NOTE: To use VS4561A Plate Set the sealing plugs at the rear of the camshafts must be removed.

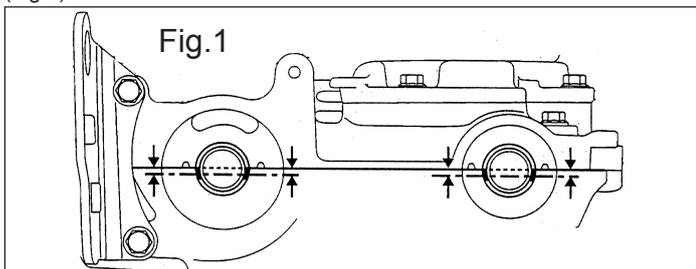
VS4562A Crankshaft Locking Pin is applicable to K4J / K4M petrol engines and K9K diesels, whilst the VS125/R1 Pin covers crankshaft locking on F4P / F4R petrol engines and camshaft timing on 1.5dCi (K9K) engines.

4.1 Engine Setting & Locking – Timing Belt Replacement

It will be necessary to support the engine and remove the right-hand engine mounting.

4.2 On 16v. petrol engines, remove the sealing plugs from the rear of the camshafts. Turn the engine to its timing position and note that the slots in the end of the camshafts are aligned horizontally.

NOTE: The slots should be below the surface line of the cylinder head. (Fig.1).



Crankshaft - 16v. Petrol Engine

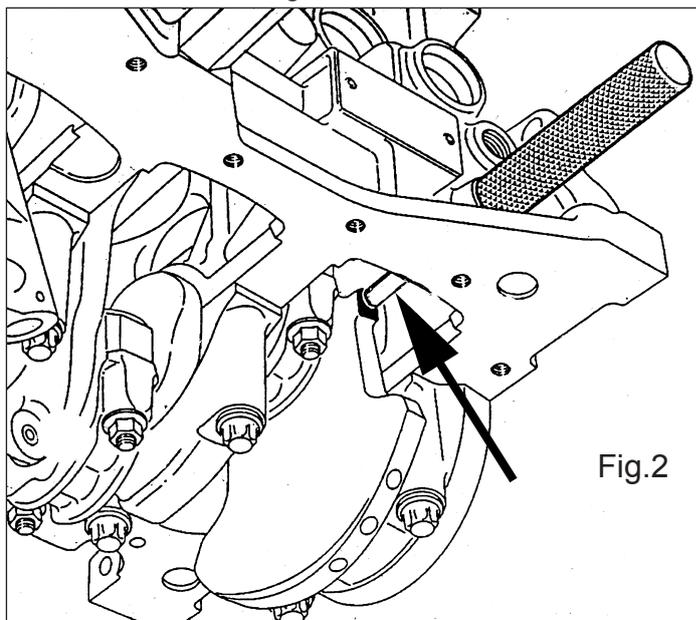


Fig.2

4.2.1 VS4562A and VS125/R1 Crankshaft Locking Pins

Insert the appropriate Crankshaft Locking Pin.

VS4562A is used for 1.4 and 1.6 K4J / K4M petrol and K9K diesel engines.

Remove the blanking plug for the crankshaft locking pin from the cylinder block and turn the crankshaft in a clockwise direction so that the camshaft is **just before** its alignment position. This will provide the correct crankshaft position for inserting the VS4562A Crankshaft Locking Pin. Screw in VS4562A Locking Pin and turn the crankshaft slightly until the "flat" on web of the crankshaft is pressing against the end of the pin. (Fig.2).

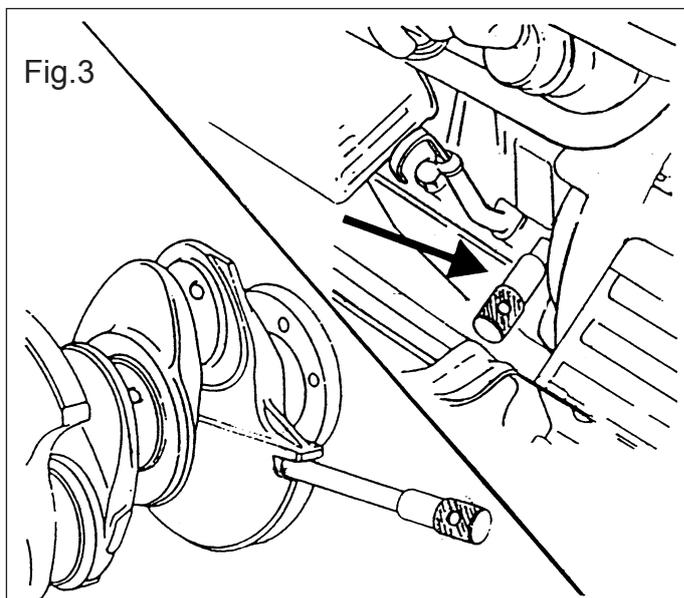


Fig.3

4.2.2 VS125/R1 is for the crankshaft on F4P / F4R engines and when inserted it enters into the timing slot in the crankshaft.

NOTE: Ensure the pin is positioned **in the timing slot** and not into a crankshaft web hole. (Fig.3).

Lock the flywheel and release the crankshaft pulley bolt and remove the crankshaft pulley.

IMPORTANT: DO NOT use Crankshaft Locking Pins to hold crankshaft in position whilst releasing or tightening the pulley bolt. Locking Pins are for retention of timing position only.

WARNING: Ensure that the crankshaft gear does not fall off the crankshaft.

4.3 Camshaft – K9K dCi engines

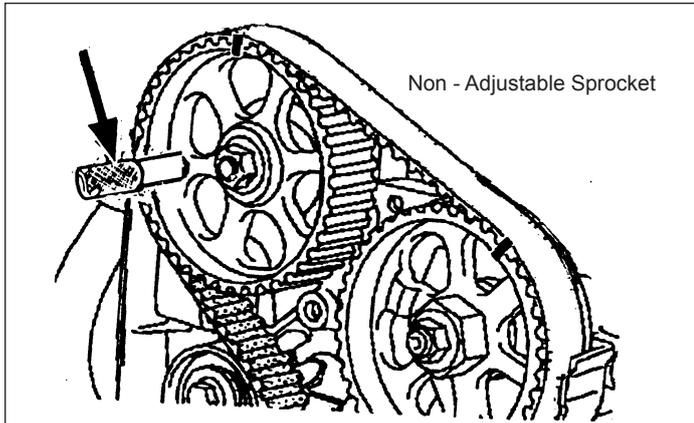
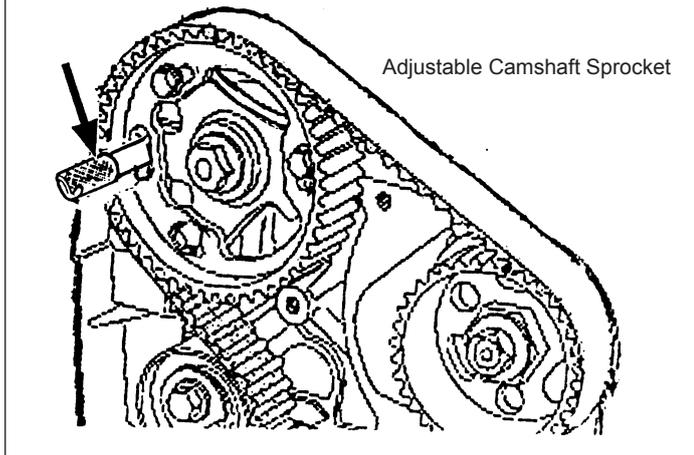


Fig.4



4.3 VS125/R1 Camshaft Locking Pin

Insert VS125/R1 Pin through the timing hole in the camshaft sprocket and into the timing hole in the cylinder head. (Fig.4).

NOTE: Some 1.5 K9K engine variants have an adjustable camshaft sprocket (identified by 3 x sprocket retaining bolts to a camshaft carrier plate and elongated timing slot in the sprocket).

4.3.1 Remove the crankshaft pulley, slacken the belt tensioner and remove belt. Once a belt has been removed, a new belt and tensioning rollers must be fitted.

4.3.2 Check the positions of timing marks - the camshaft sprocket (positioned by Pin), the crankshaft (keyway vertically upwards) and the fuel pump (approx 1-o'clock position aligned with bolt head directly behind sprocket. i.e. one tooth to right of vertical axis).

NOTE: If the engine variant has an adjustable camshaft sprocket, remove one bolt and slacken the other two by one turn.

4.3.3 Fit the new timing belt, commencing at the crankshaft gear. Ensure that the marks on the belt are aligned with the timing marks on the camshaft, HP pump and crankshaft sprockets. There should be 19 tooth spaces between camshaft and HP pump timing marks and 51 tooth spaces between crankshaft and HP pump marks.

4.4 Camshaft – 16v. Petrol Engines

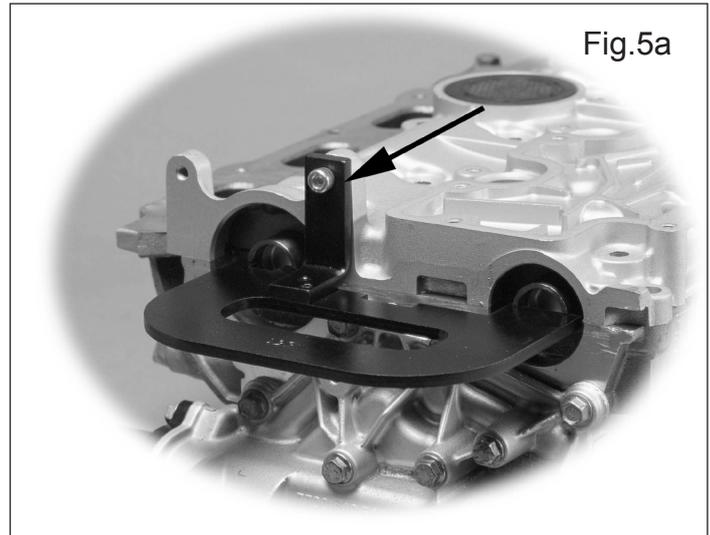


Fig.5a

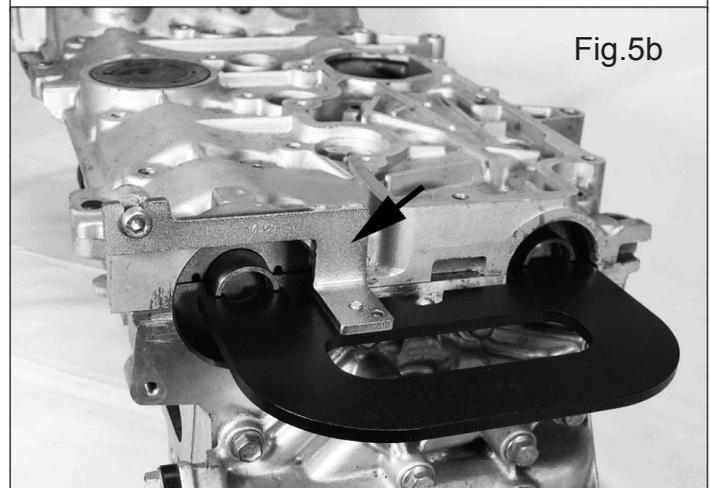


Fig.5b

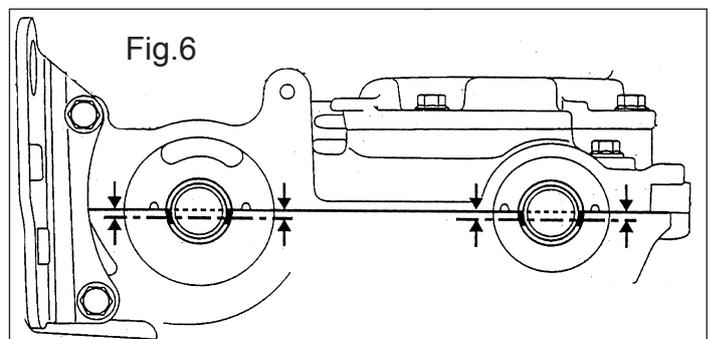
VS4561A Camshaft Setting Plate

With the crankshaft 'locked' in position, check that the slots in the ends of the camshafts are aligned horizontally

4.4.1 Construct the Camshaft Setting Plate Assembly by using the VS4561 Plate and attaching to it the appropriate Location Bracket – The Right-angled Bracket shown in (Fig.5a) or the Extended Bracket – shown in (Fig.5b).

4.4.2 The Extended Bracket (VS4563) will be required when a **camshaft position sensor is fitted on some K4J / K4M engines in Clio III, Scenic II, Laguna II and Modus**

Fit VS4561A Setting Plate securing it to the engine using the appropriate Location Bracket.



Slots in end of camshafts align horizontally and are below the surface line of the cylinder head. (Fig.6).

4.4.3 Slacken tensioner and remove together with guide roller and timing belt.

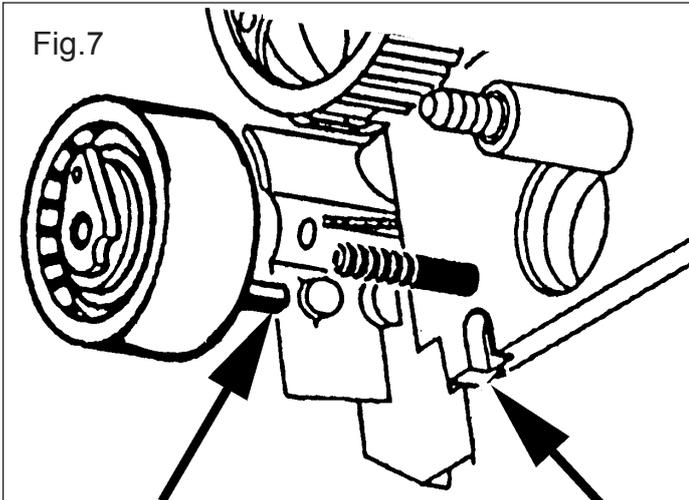
4.5 Belt Guide Removal

1.4 / 1.6 16v. K4J / K4M engines in Clio III, Megane / Scenic II, Laguna II, Modus and Kangoo.

On timing belt replacement on these engines, the belt guide roller must be removed and replaced.

4.6 Installing a new timing belt – 16v. Petrol Engines

With VS4561A fitted and retaining the camshafts in position, and either VS4562A or VS125/R1 Pin 'locking' the crankshaft, fit a new guide roller and tensioner pulley. The pin on the tensioner locates into the slot in the cylinder head.



4.6.1 IMPORTANT: It is vital to degrease the bore and contact surface of the crankshaft gear and pulley and end of crankshaft to prevent slip during re-assembly. (Fig.7).

4.6.2 The new timing belt is fitted in an **anti-clockwise** direction commencing at the crankshaft. Ensure it is taut on the non-tensioner side.

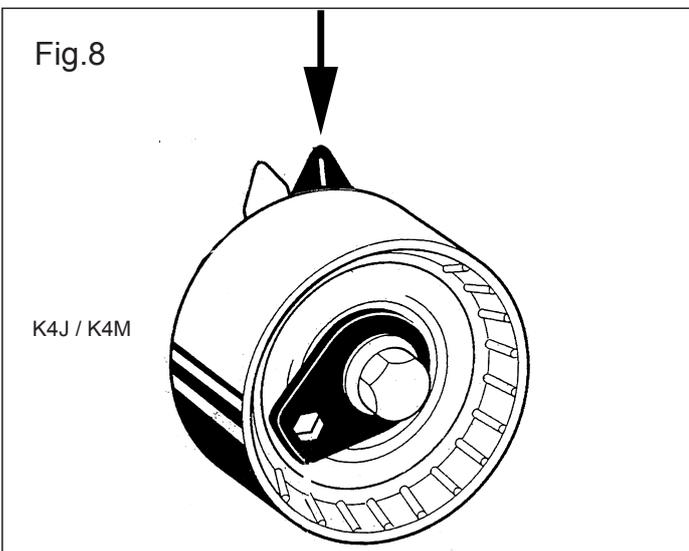
4.6.3 Measure the crankshaft pulley bolt. If longer than 49.1mm. replace with new bolt.
Fit crankshaft pulley – if reusing the original bolt, oil threads. If fitting a new bolt – **DO NOT** lubricate.

4.6.4 IMPORTANT: When installing do not fully tighten crankshaft bolt – leave approx. 2mm. clearance between pulley and bolt head.

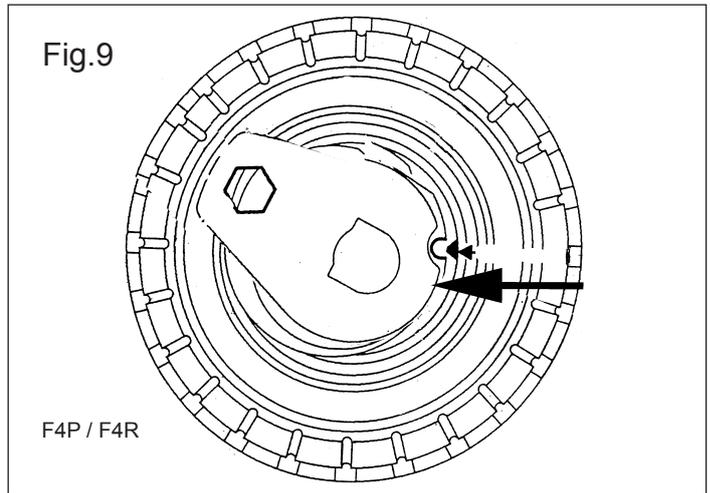
4.7 Belt Tensioning

4.7.1 Initial tensioning– 16v. Petrol Engines

Turn tensioner clockwise until...

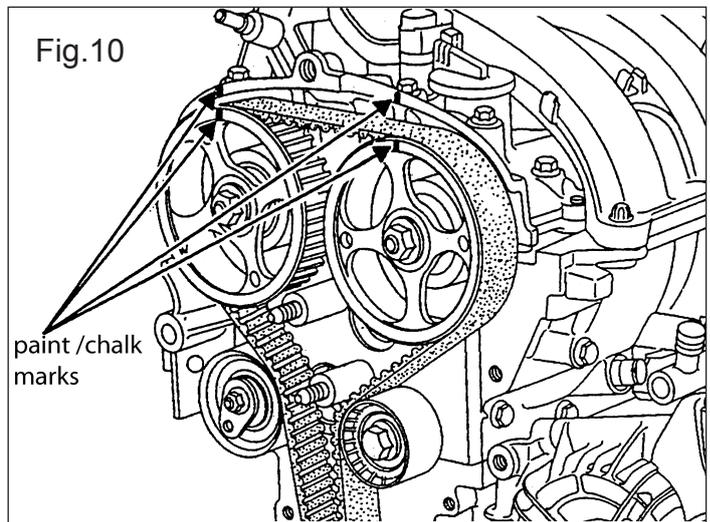


For K4J/K4M – moving pointer is at its right-hand stop position (7 to 8mm. past fixed pointer). (Fig.8).



For F4P / F4R – tensioner marks align... and tighten nut. (Fig. 9).

4.7.2 NOTE: The engine is now rotated to equalise belt tension, however it is useful to be able to determine the point at which the engine has returned to **just before** its 'timed' position, to help with insertion of the crankshaft pin. Therefore mark the camshaft sprockets at the 12-0-clock position, with a paint/chalk mark and place a corresponding mark on the cylinder head directly behind them.



Mark camshafts / cylinder head. (Fig.10).

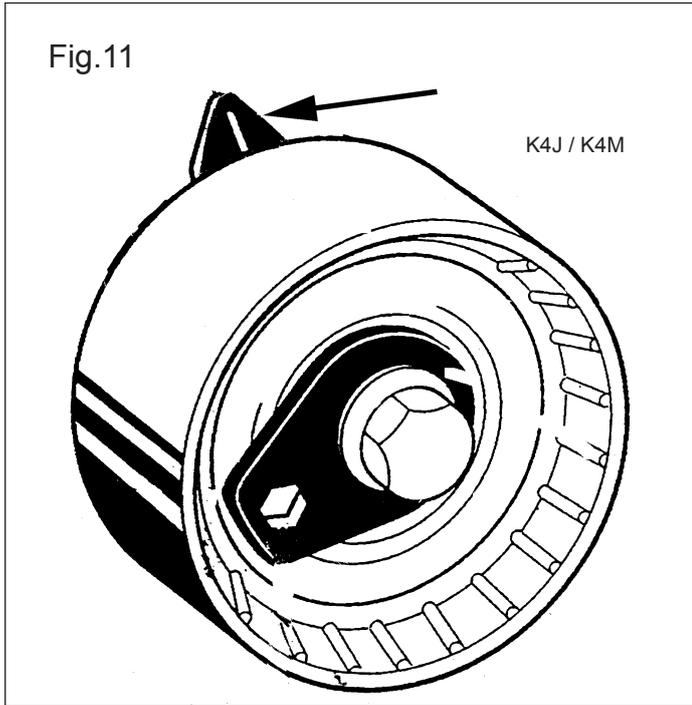
4.7.3 Remove the Camshaft Setting Plate and Crankshaft Locking Pin. Lock the flywheel in position and tighten the crankshaft pulley bolt.

4.7.4 Rotate the engine twice in a **clockwise** direction, returning to a point **just before** the timing position (use guide marks made earlier on camshaft sprockets).

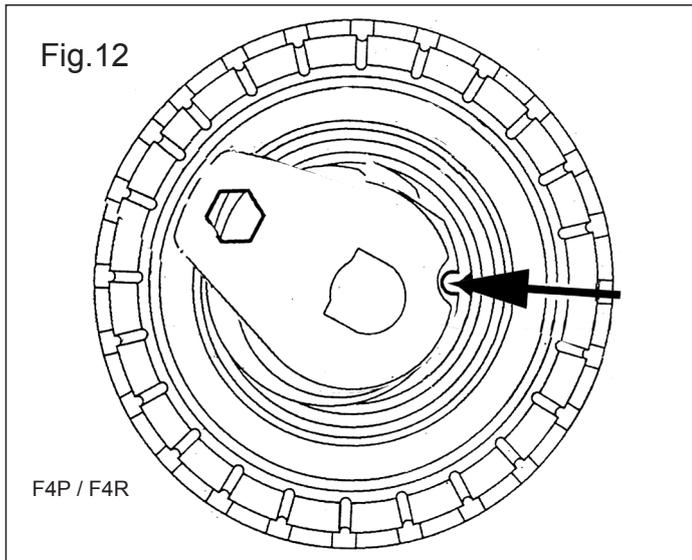
4.7.5 Insert the appropriate Crankshaft Locking Pin, VS4562A or VS125/R1 and carefully rotate the engine further to its 'timed' position ensuring correct location of Locking Pin in the crankshaft, as previously described.

4.7.6 Check that the camshaft slots are aligned horizontally and are below the surface line of the cylinder head, and fit AST4561A Camshaft Setting Plate ensuring it can be easily inserted.

4.7.7 Final tensioner positions– 16v. Petrol Engines



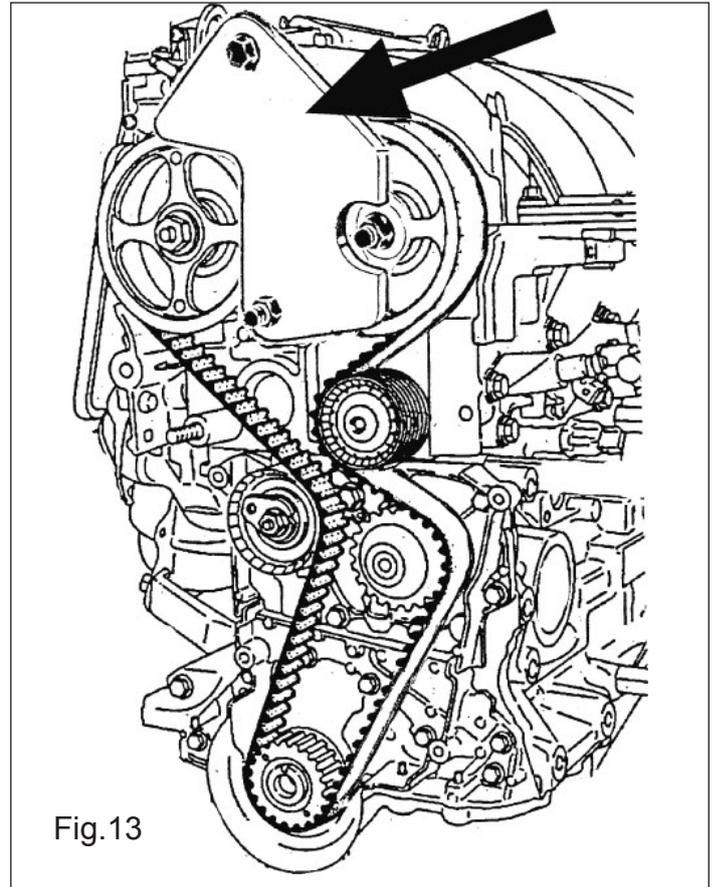
K4J/K4M – Turn tensioner anti-clockwise until both pointers align. (Fig. 11).



F4P / F4R – Check that the tensioner marks still align. If not – repeat tensioning procedure. (Fig.12).

Remove all timing tools.

4.8 Timing Adjustment – 1.4 / 1.6 K4J / K4M petrol engines.



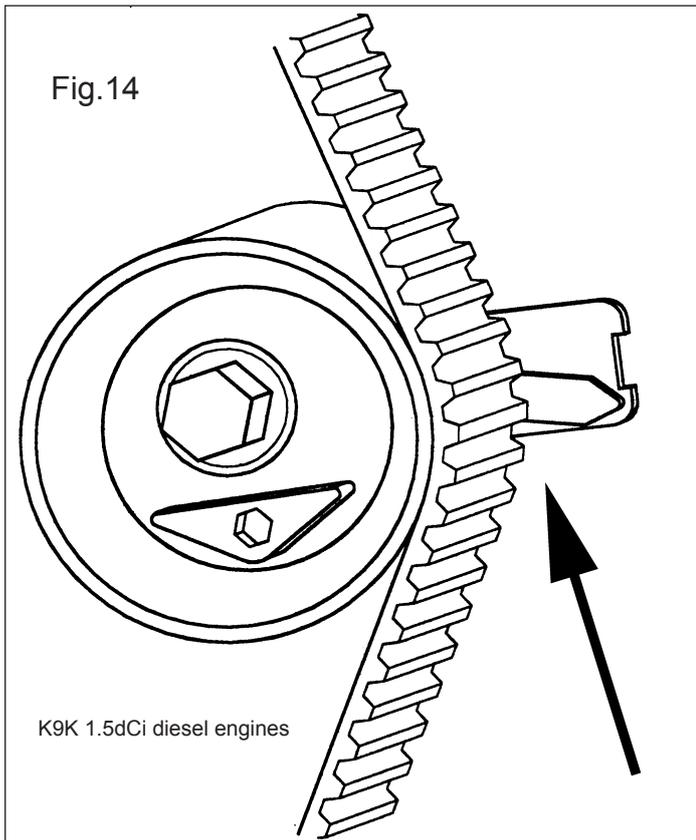
VS4623 Camshaft Sprocket Locking Tool **Associated Tool – not in Kit**

4.8.1 If the correct crankshaft and camshaft timing positions cannot be achieved and the VS4561A Setting Plate Assembly cannot be fixed in place after the VS4562A Crankshaft Locking Pin has been inserted, it may be necessary to release the camshaft sprocket bolts in order to make a timing adjustment.

4.8.2 In order to release and tighten the camshaft sprocket bolts, the camshaft sprockets must be first 'locked' in place with Tool VS4623. This will counter-hold the sprockets whilst the bolts are released / tightened. (Fig.13).

4.8.3 Insert VS4562A Crankshaft Locking Pin and fit Sprocket Locking Tool VS4623. Release the camshaft sprocket bolts and turn the camshafts so that Setting Plate assembly can be easily inserted. Tighten camshaft sprocket bolts and remove all tools. Check that the belt tensioner position is correct.

4.9 K9K 1.5dCi Diesel Engines - Belt Tensioner Positions



4.9.1 Apply initial belt tension by turning the tensioner **anti-clockwise** so the "pointer" is positioned **below** the "notch" – see diagram above. (Fig.14).

NOTE: If adjustable camshaft sprocket fitted, check that the remaining two sprocket bolts are not at the end of their elongated slots. Re-fit the 3rd bolt and tighten all 3 x sprocket retaining bolts

4.9.2 Re-fit the crankshaft pulley and remove VS4562A and VS125/R1 Locking Pins.

4.9.3 Rotate the crankshaft two turns and return to a position where the crankshaft and camshaft locking pins can be inserted to check timing is correct, **then remove the pins.**

4.9.4 For final tensioner position, slacken tensioner bolt (1 turn only) and adjust tensioner **clockwise** until the "pointer" **aligns** with the "notch".

NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

IMPORTANT: No liability is accepted for incorrect use of this product.

WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.

INFORMATION: For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.