



INSTRUCTIONS FOR:

DIESEL ENGINE SETTING/LOCKING KIT FORD TDCi

MODEL NO: **VS4830**

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 & 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. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.



Refer to the instruction manual



Wear eye protection

1. SAFETY

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

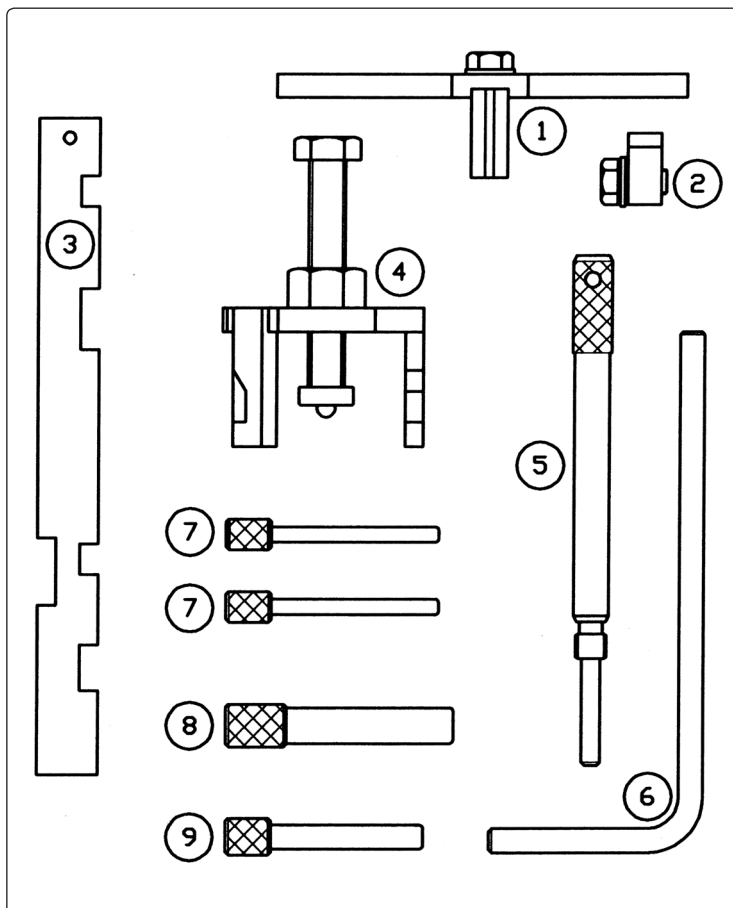
IMPORTANT: These instructions are provided as a guide only. Always refer to the vehicle manufacturer's service instructions, or a proprietary manual, to establish the current procedure and data. Product Information Sets detail applications and use of the tools, with any general instructions provided as a guide only.

2. INTRODUCTION

Comprehensive set covers all current Ford 1.4, 1.6, 1.8 and new 2.0 TDCi diesels giving comprehensive coverage of all the modern Ford belt drive diesel engines. Includes camshaft, crankshaft and high pressure pump locking tools plus camshaft sprocket removal tool. 1.4 and 1.6TDCi Diesels are also in Citroen and Peugeot models designated as HDi. Kit includes locking tag.

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| - | VS4830/84 | Case + Insert |



4. APPLICATIONS

OEM Tools: 21 104, 21 162B, 21 168, 21 229, 303 193, 303 376, 303 376B, 303 393, 303 393 01, 303 651

1.4TDCi, 1.6TDCi, 1.8Di / TDdi / TDCi, 2.0TDCi / (Belts).

Timing Belt Replacement Applications on DURATORQ diesel engines in-:

FORD: Courier (00-02), Fiesta (02-11), C-Max (03-10), Focus (98-11), Fusion (02-11), Galaxy (06-10), Mondeo (07-10), S-Max (06-10)
Tourneo Connect (02-13), Transit Connect (02-13), Kuga (06-10)

MAZDA: 2 3

The 1.4TDCi and 1.6TDCi diesels are also in Citroen / Peugeot models designated as HDi engines.

Engine Codes: F6JA, F6JB, F6JC, HHJA, HHJB, G8DA, HHDA, HHDB, RTN, RTQ, RTP, C9DC, BHDA/B, BHPA, C9DA/B, C9DC, F9DA/B, FFBA, FFDA, HCPA, HCPB, KKDA, P7PA, P9PA, QYWA, R2PA, R3PA, RWPA, G6DA, G6DB, G6DC, AZWA, QXWA, QXWB.

5. OPERATION

VS4830 Diesel Engine Setting / Locking Tool Kit Comprises:

For 1.4TDCi / 1.6TDCi (Belt).

VS4735/P15 Crankshaft & Fuel Pump Sprocket Locking

Pins x 2.

VS4735/P16 Flywheel Locking Pin.

For locking engine whilst removing and installing crankshaft pulley / bolt.

VS4735/P17 Camshaft Locking Pin.

For 1.8TDi / TDdi / TDCi (Belt).

VS101/2 Crankshaft TDC Location Pin.

VS4933 Camshaft Setting Plate.

VS1012/02 Flywheel Locking Tool.

VS1012/01 Camshaft Sprocket Remover.

For 2.0TDCi (Belt).

VS4830/F6 Flywheel Locking Pin.

VS4834/01 Adaptor for use with VS1012/02 Flywheel Locking Tool.

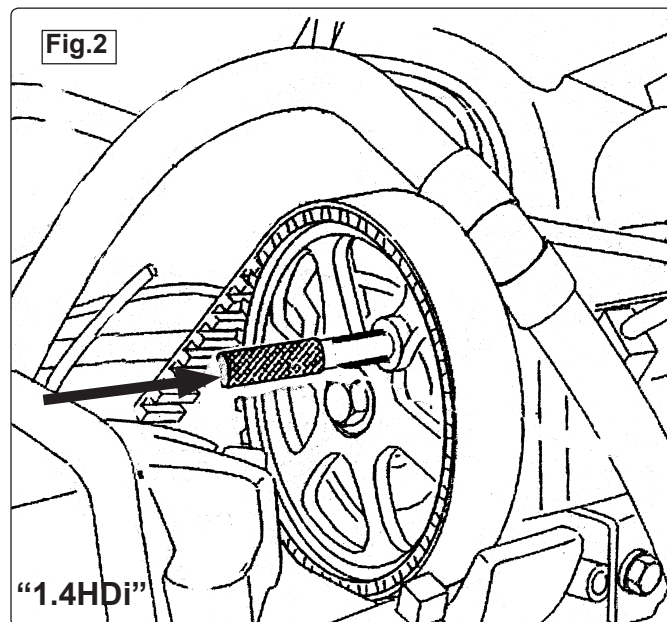
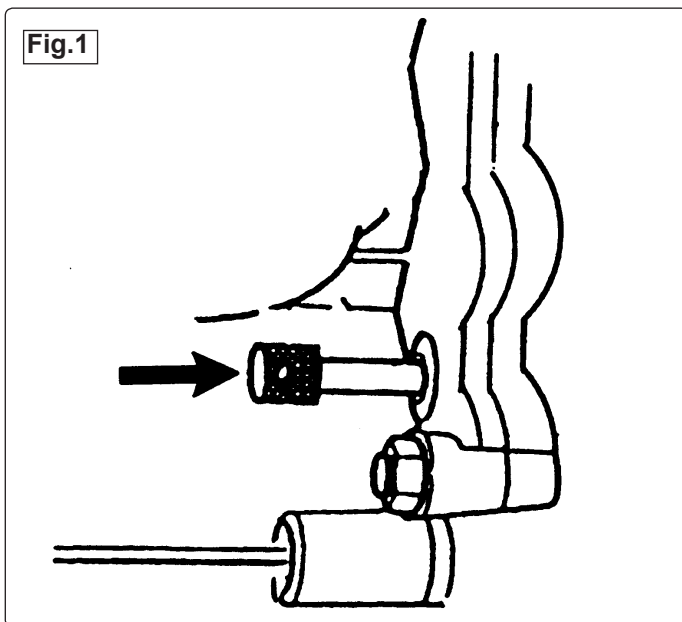
(Also VS4735/P17 Pin as detailed in 1.4TDCi / 1.6TDCi).

5.1. FORD 1.4 and 1.6TDCi Diesel Engines

Ford 1.4TDCi and 1.6TDCi diesels are also in Citroen / Peugeot models designated as HDi engines.

Timing belt replacement on these engines requires the use of 4 Locking Pins.

Remove the RH road wheel and inner wing cover. Move the electrical harness away from the belt upper cover and remove auxiliary belt, upper timing belt cover and the blanking plug in the bell housing where Locking Pin VS4735/P16 is to be inserted.



5.1.1 VS4735/P16 Flywheel Locking Pin

Rotate the crankshaft until VS4735/P16 can be inserted into one of the slots in the flywheel to 'lock' the engine. (Fig.1).

Remove the crankshaft pulley, lower timing belt cover, crank position sensor, (check that the magnetic track is not damaged) and belt guide angle bracket.

WARNING DO NOT touch the magnetic track (sensor ring).

Re-fit the crankshaft pulley bolt (to facilitate engine turning), and remove Locking Pin VS4735/P16.

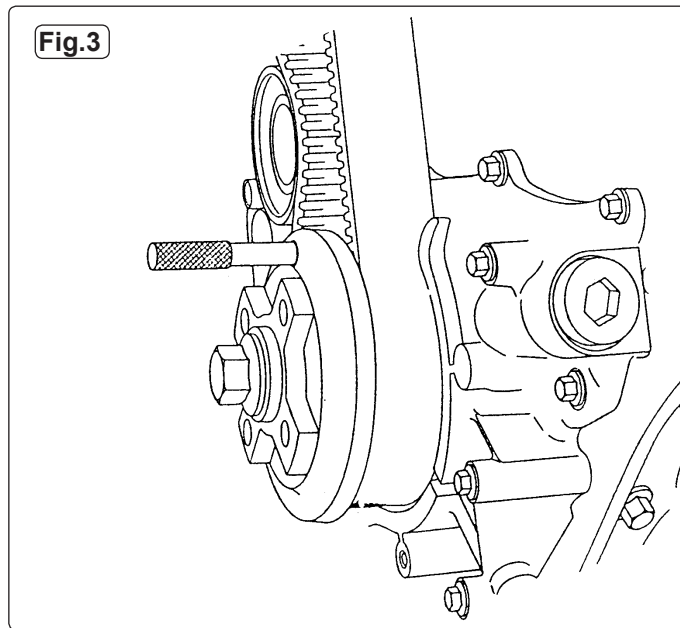
5.1.2 VS4735/P17 Camshaft Locking Pin

Turn the engine until the camshaft sprocket timing holes align, and insert Locking Pin VS4735/P17. (Fig. 2).

Check that the crank keyway is in the 11-0-clock position and insert Locking Pin VS4735/P15 to confirm correct crankshaft position.

5.1.3 VS4735/P15 Crankshaft and Fuel Pump Sprocket Locking Pins (2 in set)

Check that the crankshaft keyway is in the 11-o'clock position and insert Locking Pin VS4735/P15 to confirm correct crankshaft position. **(Fig.3)**. One of the VS4735/P15 Locking Pin is used to lock the crankshaft and the other one locks the fuel pump sprocket. Check the fuel pump alignment via holes in the pump sprocket. If there is not a corresponding hole in the pump bracket to the hole in the sprocket, then align by positioning the holes in the sprocket vertically. Support the engine to allow removal of the RH engine mounting/bracket, release the tensioner and remove the old timing belt. Ensure the camshaft sprocket and crankshaft are locked in timing position with Pins P17 and P15 respectively. Ensure the fuel pump is aligned correctly.



5.1.4 Fit the new timing belt and install the engine mounting/bracket. Apply tension to the belt by turning the tensioner **anti-clockwise** until the pointer is positioned between the sides of the window. Re-fit crank position sensor and belt guide angle bracket. **(Fig.4)**.

WARNING! DO NOT touch the magnetic track (sensor ring).

5.1.5 Remove the Locking Pins. Carefully rotate the crankshaft 10 times **clockwise**. Check engine timing by ensuring that the camshaft and crankshaft locking pins can be inserted and that the fuel pump sprocket is correctly aligned. Remove all Locking Pins and check the tensioner pointer is positioned within the window. Insert the Locking Pin P16 into the flywheel and fit the crankshaft pulley using a new centre bolt.

5.2. FORD 1.8 TDi/TDdi/TDCi Diesel Engines

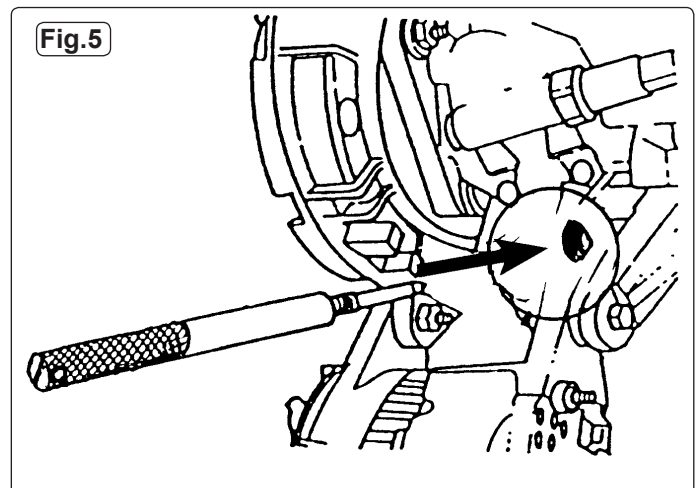
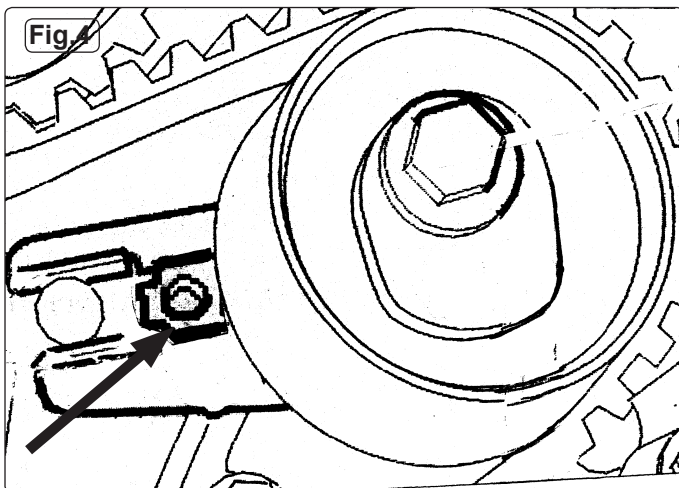
This range of Ford diesel started as turbo, direct injection engines and later incorporated common rail technology. The Endura/Duratorq 1.8 Direct Injection engine utilises a chain drive from the crankshaft to the injection pump and a tooth drive belt from the injection pump to the camshaft.

IMPORTANT: A new belt **MUST** be installed if the tension has been released from an existing belt.

5.2.1 VS101/2 Crankshaft TDC Location Pin

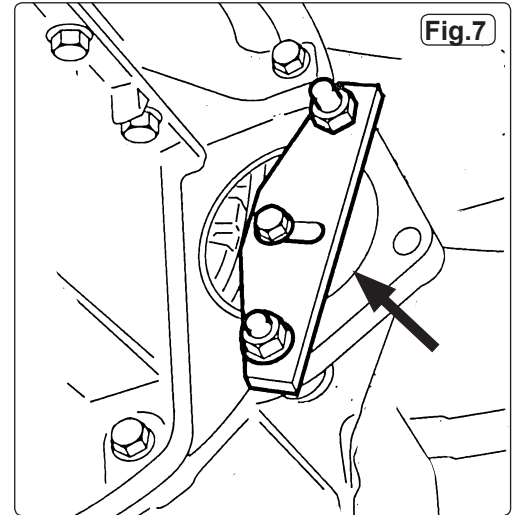
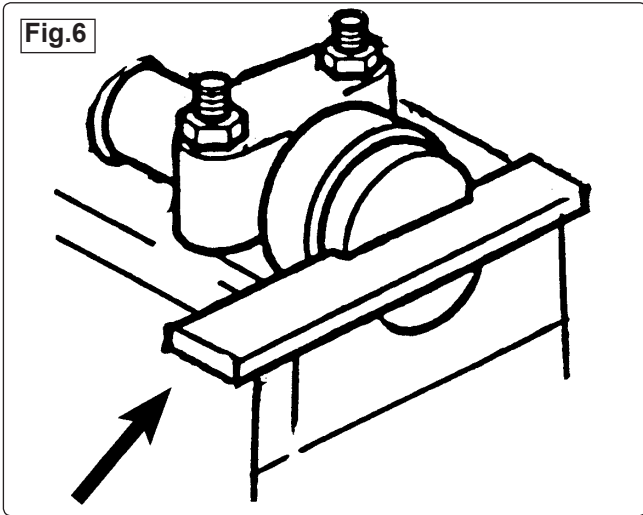
This is designed to screw into the cylinder block and provide a stop for the crank web to be positioned against to set the TDC position.

(Fig. 5). Turn the engine in normal direction of rotation until the slot in the injection pump sprocket is approx. in the 11-o'clock position. Remove the plug from the cylinder block access hole and screw in VS101/2. **Slowly and carefully** turn the crankshaft **clockwise** until the crankshaft web rests on the Locking Pin. No.1 cylinder is now set at TDC on ignition stroke.



5.2.2 VS4933 Camshaft Setting Plate

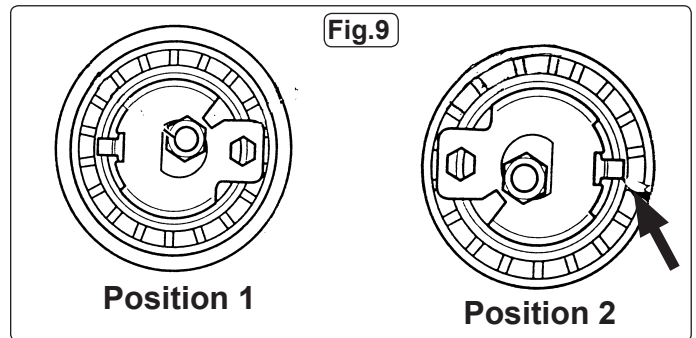
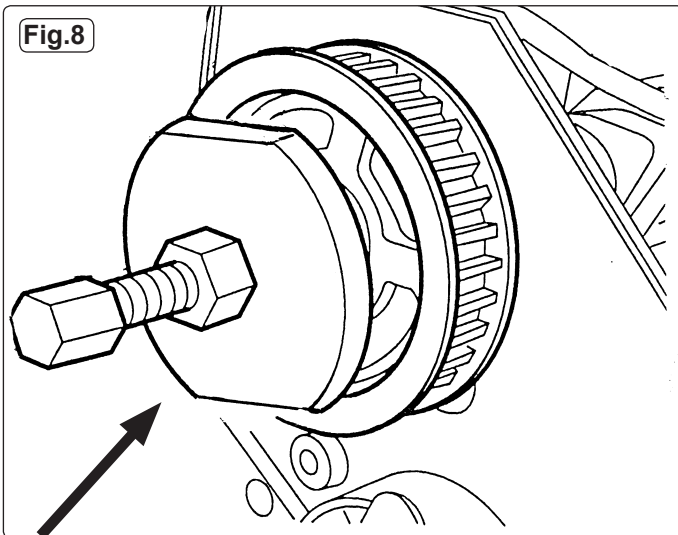
On Ford 1.8 diesel engines, **1996 onwards**, VS4933 Setting Plate is used to accurately align an off-centre datum slot in the end of the camshaft with the top face of the camshaft housing, to hold the camshaft in its 'timed' position. A notch is designed into the Setting Plate to accommodate the raised part of the housing. **(Fig.6)**.



5.2.3 VS1012/02 Flywheel Locking Tool

For renewal of the camshaft drive belt the crankshaft is located at TDC using the VS101/2 Pin but additionally VS1012/02 Flywheel Locking Tool is fitted as the crankshaft web **MUST** be 'locked' against the VS101/2 Pin. (Fig.7).

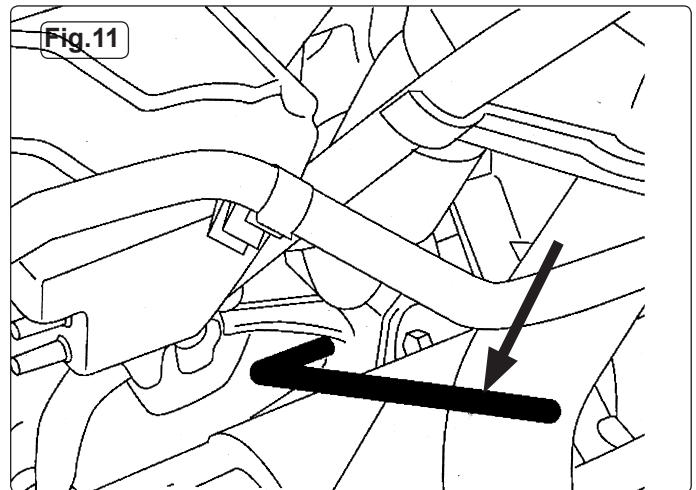
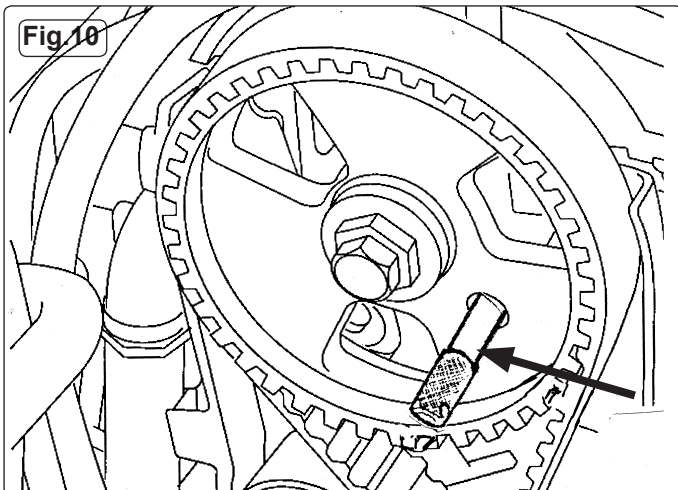
IMPORTANT: Ensure the engine does not move whilst fitting VS1012/02, and that it engages the flywheel correctly. Fit the **VS4933** Setting Plate into the off-centre slot in the rear of the camshaft. It will be necessary to support the engine and remove the front engine mounting. The belt tensioner is then slacked and turned **clockwise** away from the belt.



5.2.4 VS1012/01 Camshaft Sprocket Remover

The camshaft sprocket must be free to turn on its taper. Using a suitable sprocket Holding Tool the camshaft sprocket bolt is slacked and the sprocket loosened from its taper using VS1012/01 Remover. Remove old belt. (Fig.8).

5.2.5 When fitting a new belt the automatic tensioner must be in **Position 1**. Fit belt and then turn tensioner **anti-clockwise** until pointer is in **Position 2**. (Fig.9). Counter-hold the camshaft sprocket with a suitable holding tool and tighten the sprocket bolt. Remove all locking tools and rotate the engine six times. Refit crankshaft pin and flywheel locking tool. Check tensioner pointer is in **Position 2** and that the camshaft setting plate can be inserted.



5.3. FORD 2.0TDCi (Belt)

Introduced 2003 in the Focus C-Max following an engine development joint venture with PSA (Citroen/Peugeot), these second generation common rail diesels have a camshaft timing belt (unlike the Ford 2.0 / 2.2 / 2.4 diesels in Mondeo / Transit which are Chain Drive).

It is necessary to dismantle major components for this belt replacement application including removal of the auxiliary belt, starter motor and coolant expansion tank.

5.3.1 VS4735/P17 Camshaft Locking Pin

Turn the crankshaft until the timing hole in the camshaft sprocket aligns with the datum hole – 4-o-clock position. (Fig.10). Insert VS4735/P17 Camshaft Locking Pin.

5.3.2 VS4830/F6 Flywheel Locking Pin

Insert VS4830/F6 Locking Pin in to the flywheel to 'set' the crankshaft position prior to 'locking' in place with the Flywheel Locking Tool. (Fig.11).

5.3.3 VS1012/02 Flywheel Locking Tool and VS4834/01 Adaptor

The Flywheel Locking Tool configuration for the 2.0TDCi engine is obtained by using the Main Plate from VS1012/02 Locking Tool and attaching to it the VS4834/01 Adaptor. (Fig.12).

the Flywheel Locking Tool Assembly is firmly bolted in position where the starter motor is normally fitted and locates on to the flywheel through the starter motor aperture. Adjust the Adaptor to 'lock' in to the teeth of the flywheel before firmly bolting it in place, to retain the crankshaft in a fixed position.

5.3.4 Release and remove the crankshaft pulley bolt (**DO NOT** discard bolt at this stage).

5.3.5 Remove the crankshaft pulley. **WARNING: DO NOT touch the outer sensor ring.**

5.3.6 Remove the tensioner pulley and the old timing belt – **DO NOT** re-fit a used belt.

5.4 Installing new timing belt

Install the new belt with the directional arrows in the direction of crankshaft rotation. Fit new tensioner pulley with its retaining bolt screwed in finger-tight only.

5.4.1 Use an Allen key to turn the tensioner **anti-clockwise** to apply tension to the belt. Check that the tensioner pointer is positioned on the left side of the tensioner window, and tighten the pulley retaining bolt. (Fig.13).

5.4.2 Prepare to re-fit the crankshaft pulley. **WARNING: DO NOT touch the outer sensor ring.**

5.4.3 Use the old pulley centre bolt to install the crankshaft pulley, tighten the bolt to 50Nm.

5.4.4 Remove the VS4830/F6 Flywheel Locking Pin and VS4735/P17 Camshaft Locking Pin. Remove the Flywheel Locking Tool.

5.4.5 Turn the crankshaft **4 times**, by hand, in the normal direction of rotation. Align the timing and datum holes for the camshaft sprocket and insert VS4735/P17 Pin. Insert the VS4830/F6 Flywheel Locking Pin and the Flywheel Locking Tool.

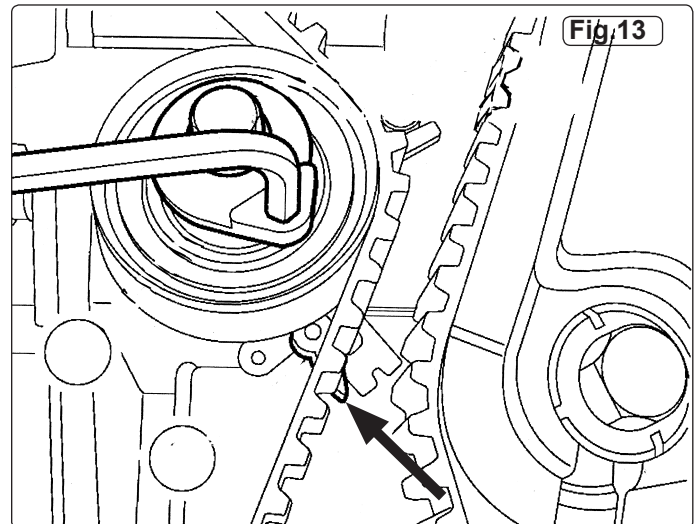
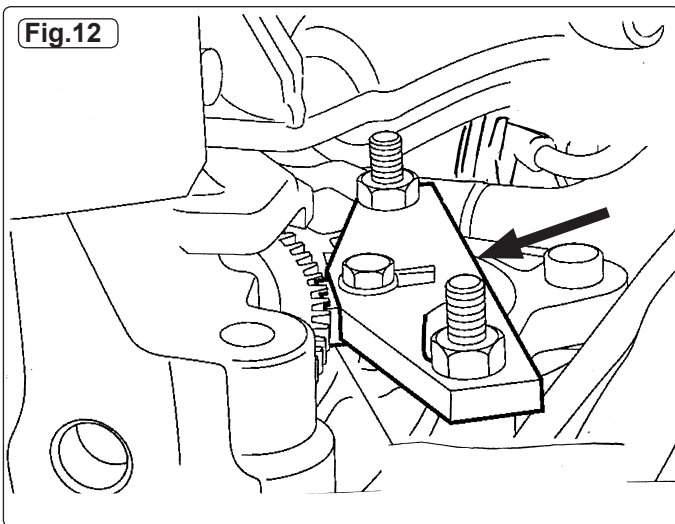
5.4.6 Release and remove the crankshaft pulley bolt and discard. Remove the crankshaft pulley.

5.5 Final Tension Position

Use an Allen key on the tensioner to maintain tension on the timing belt. Slacken the tensioner retaining bolt and **position the pointer CENTRALLY** within the window of the tensioner. Tighten the tensioner bolt.

5.5.1 Install the crankshaft pulley with a new centre bolt and tighten in 2 stages – 70Nm. + 62 degrees.

5.5.2 Remove all tools.



Environmental Protection

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment.

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.



SEALEY

Sole UK Distributor, Sealey Group,
Kempson Way, Suffolk Business Park,
Bury St. Edmunds, Suffolk,
IP32 7AR



01284 757500



www.sealey.co.uk



01284 703534



sales@sealey.co.uk