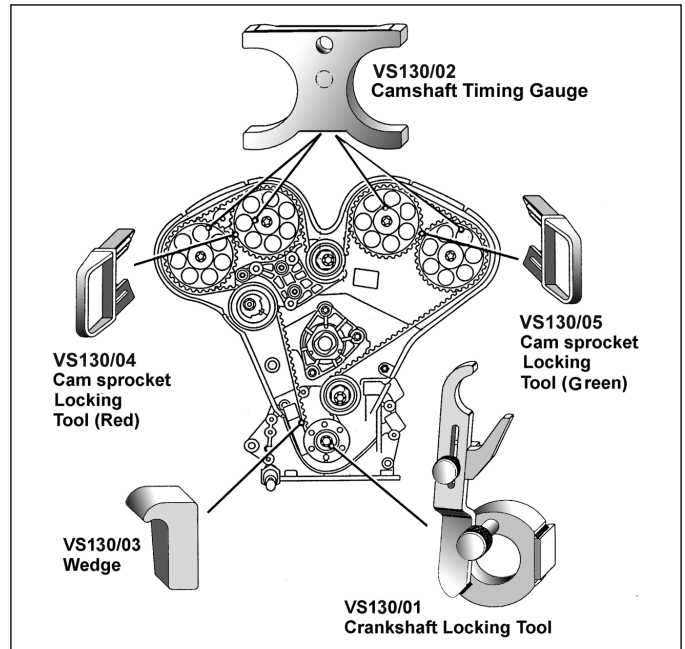
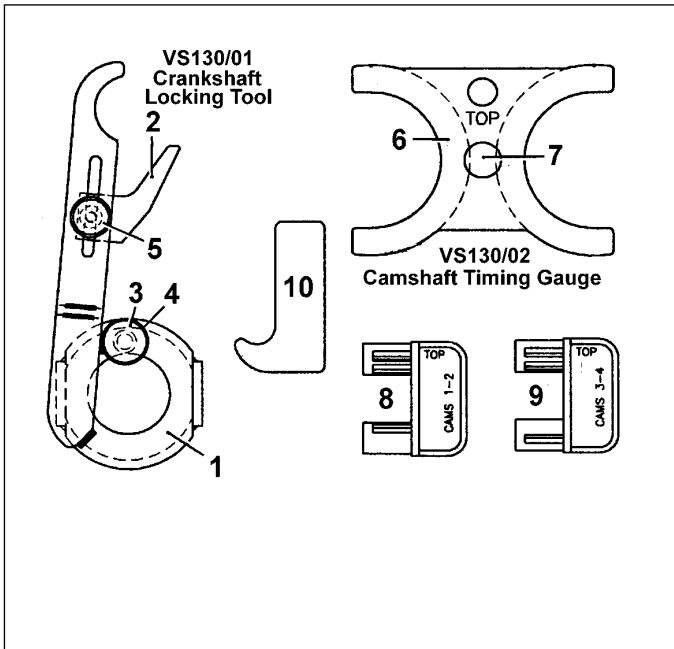


**For: VAUXHALL / OPEL V6 Ecotec Engine**



**STANDARD PARTS LIST**

	VS130/01	Crankshaft locking tool (1 to 5)
1	VS130/1A	Main body
2	VS130/1E	Locking arm
3	VS130/1H	Shoulder screw
4	VS130/1K	Circlip
5	VS130/1J	Thumbscrew

6	VS130/02	Timing gauge (6 + 7)
7	VS130/2A	Magnet
8	VS130/04	Locking tool
9	VS130/05	Locking tool
10	VS130/03	Wedge

**1. INTRODUCTION & APPLICATIONS**

The VS130 Setting and Locking Tool Kit includes all the tools required to maintain the crankshaft gear and camshaft sprockets at TDC for service work requiring timing belt removal, renewal and installation on the Ecotec V6 multi-valve engine. The kit includes the essential timing gauge for checking camshaft sprocket timing mark alignment during installation of the timing belt.

**WARNING!** *Incorrect installation of the timing belt/engine timing positioning will result in engine damage.*

**Applications**

**Vauxhall/Opel:** Cavalier/Vectra/Calibra 2.5i, Omega-B 2.5i/3.0i, Sintra 3.0i. Ecotec V6 multi-valve engine.

**Saab:** 900 2.5 V6, 9000 3.0 V6

**Associated Tools/Applications:**

Petrol Engine Twin Cam Setting/Locking Tool Kit - Ford, Honda, Rover, Mazda, Vauxhall/Opel  
 Petrol Engine Setting/Locking Tool Kits - BMW

**Order Part Number:**

VS171  
 VS118 & VS126

**2. SAFETY INSTRUCTIONS**

**WARNING!** *Ensure all health and safety, local authority, and general workshop practice regulations are strictly adhered to when using tools.*

**X** DO NOT use tools if damaged.

✓ Maintain tools in good and clean condition for best and safest performance.

✓ If required, ensure the vehicle to be worked on is adequately supported with axle stands, ramps and chocks.

✓ 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 and parts being used and do not leave them near the engine.

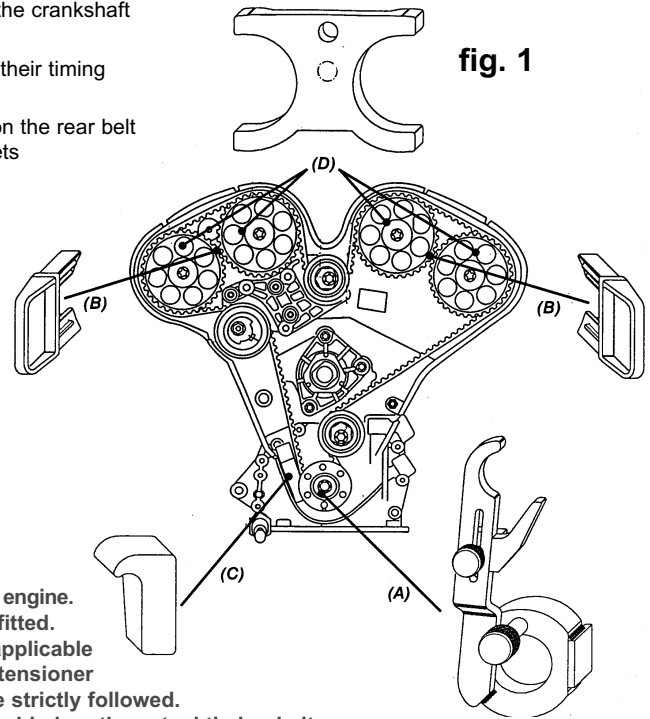
**IMPORTANT:** *Always refer to the vehicle manufacturer's service instructions, or proprietary manual to establish the current procedure and data. These instructions for use are provided as a guide only.*

### 3. INSTRUCTIONS FOR USE

Always refer to the vehicle manufacturer's service instructions, or proprietary manual, to establish the current procedures and data. Instructions for use are provided as a guide only.

#### 3.1 FITTING THE LOCKING TOOLS & TIMING BELT REMOVAL

- ❑ **WARNING!** Timing belt must not be removed without first locking camshaft sprockets & crankshaft gear in the TDC position using VS130 Tool Kit. If a timing belt is installed wrongly, engine damage will result. Always rotate crankshaft in the direction of normal engine rotation.
- 3.1.1. Remove the auxiliary belt, its tensioner, and other components including crankshaft pulley and timing belt cover to gain access to the timing belt. VS130/01 Locking Tool is used to lock the crankshaft in position.
- 3.1.2. Turn the crankshaft to *JUST BEFORE TDC* at No.1 cylinder and fit VS130/01 Crankshaft Locking Tool, utilising the 'flats' on the exposed crankshaft gear drive for location. Bolt the locking tool onto the drive. Carefully rotate the crankshaft further to achieve alignment of the TDC marks and camshaft sprocket alignment to their timing marks.
- 3.1.3. Attach VS130/01 to the water pump housing via its locking arm to hold the crankshaft in TDC position ( fig.1.A).
- 3.1.4. VS130/04 & VS130/05 Locking Tools are used to hold the camshafts in their timing position (fig.1.B).
- 3.1.5. The camshaft sprocket timing marks must be aligned with the notches on the rear belt cover. Insert Camshaft Locking Tool VS130/04 (**B red**) between sprockets 1 & 2 (left hand pair).
- 3.1.6. Insert Camshaft Locking Tool VS130/05 (**B green**) between sprockets 3 & 4 (right hand pair). Ensure designation "Top" on tool is uppermost when inserting these tools.



**NOTE:** Inserting the tools between the camshaft sprockets may be helped by slightly turning the upper belt guide clockwise (to assist sprockets 1 & 2) and the lower belt guide (to assist sprockets 3 & 4). The camshaft sprockets are now 'locked' in position.

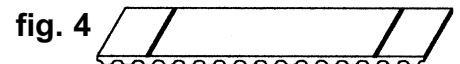
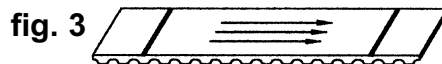
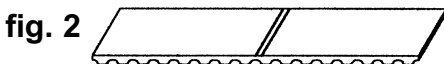
- 3.1.7. Slacken the belt tensioner bolt and rotate tensioner clockwise to release tension on the belt.

**The timing belt can now be removed.**

#### 3.2. TIMING BELT INSTALLATION

##### ▲ CAUTION!

- a) Always replace with a new timing belt and install the belt on a cold engine.
- b) The method of fitting the belt is dependent upon the tensioner fitted. We therefore stress the importance of establishing the correct/applicable procedure for belt installation and tensioning according to the tensioner fitted - see 3.2.2. The vehicle manufacturer's directions must be strictly followed.
- c) V6 Timing Belt Guide Marks - It is vital that the guide marks provided on the actual timing belt are used and are observed during installation.



##### 3.2.1. Preparation.

- a) VS130/01 Crankshaft Locking Tool (fig.1.A), VS130/04 & VS130/05 Camshaft Locking Tools (fig.1.B) must be in place and **all timing marks aligned**.

The '**double line**' guide mark on the timing belt is aligned with the crankshaft timing marks (groove in the oil pump and notch in the crankshaft drive) - (fig.2).

The '**arrow**' marks on the belt must point in the direction of engine rotation (fig.3).

- b) Position the VS130/03 Wedge on the left between the crankshaft gear drive and the oil pump (fig.1.C). The wedge is used to hold the belt in place so that it can be kept taut during installation.

##### 3.2.2. Installation.

**IMPORTANT:** Always refer to the vehicle manufacturer's instructions. It is necessary to establish which tensioner is fitted, as this dictates whether the belt must be installed in an anti-clockwise or a clockwise direction.

##### 1. For anti-clockwise installation

- a) Start at the crankshaft gear drive ('**double line**' belt guide mark) and thread the belt anti-clockwise up over the lower guide, towards camshaft sprockets 4 & 3. Ensure '**arrow**' marks on the belt are pointing in the direction of engine rotation.
- b) Fit the timing belt to sprockets 4 & 3, ensuring the '**single line**' timing guide marks on the belt (fig.4), align with the timing marks on the sprockets and rear timing belt cover. The belt play between the lower guide and camshaft sprocket No.4 should not exceed 1cm (tension adjustment can be made via the lower belt guide).
- c) The belt is then fitted around the upper guide and onto camshaft sprockets 2 & 1, ensuring that the second pair of '**single line**' timing guide marks (fig.4) on the belt align with the timing marks on the sprockets and rear belt cover (again tension can be adjusted, but via the upper belt guide). Continue fitting the belt around and lay over the tensioner.

## INSTRUCTIONS FOR USE (continued)

### 2 For clockwise installation

This is usually necessary when the engine is fitted with a tensioner having a front flange. It is then not possible to install the belt anti-clockwise, as in (1). It must be installed clockwise from the crankshaft drive, ensuring the same timing belt guide mark alignment, but in the sequence:

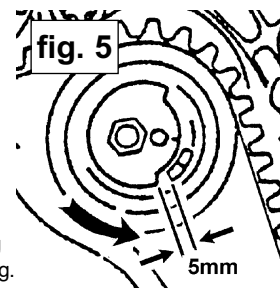
1. Tensioner.
2. Camshaft Sprockets 1 & 2.
3. Upper Guide.
4. Lower Guide.
5. Camshaft Sprockets 3 & 4

### 3.3. INITIAL TENSIONING OF THE TIMING BELT

The guides, lower first, then upper, are turned anti-clockwise to achieve a taut belt between guides and sprockets. To tension the belt always commence at the lower belt guide. Turn the guide anti-clockwise to achieve a taut belt between guide and camshaft sprocket No.4. Then use the upper belt guide, turning anti-clockwise, to adjust tension between sprockets 2 & 3. Re-tighten guides after each adjustment to 40 Nm. **To tension belt the timing belt tensioner roller should be turned anti-clockwise until marks are 5mm apart (fig.5) and re-tighten to 20 Nm.**

3.3.1 Remove crankshaft locking tool and the two camshaft locking tools, and **VS130/03 wedge**.

3.3.2 At crankshaft drive gear, turn the crankshaft two rotations, slowly, in normal engine rotational direction, returning the timing mark on the crankshaft to TDC. Refit VS130/01 Crankshaft Locking Tool and lock it in position onto the water pump casing.



**IMPORTANT: The timing guide marks on the belt will no longer align after the crankshaft has been rotated and are not subsequently used.**

### 3.4. ADJUSTMENT TO ALIGN CAMSHAFT SPROCKET TIMING MARKS USING VS130/02 TIMING GAUGE.

3.4.1. With the crankshaft locked in TDC position, install Camshaft Timing Gauge VS130/02 into camshaft sprockets 3 & 4 to assess correct timing marks positioning (fig.6).

3.4.2. If timing marks on the sprockets are **BEFORE** the marks on VS130/02 Timing Gauge, re-align them using the lower belt guide, turning it anti-clockwise until the marks align.

3.4.3. If timing marks on the sprockets are **AFTER** the marks on VS130/02 Timing Gauge, re-align them by turning the lower belt guide clockwise until the marks align.

3.4.4. Re-tighten guide to specified torque.

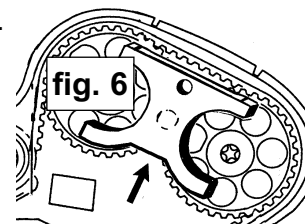
3.4.5. Remove Crankshaft Locking Tool VS130/01 and Timing Gauge VS130/02 and rotate the crankshaft two revolutions in normal direction of engine rotation. Return the crankshaft timing mark to TDC and lock in position with VS130/01 again.

3.4.6. Re-check that camshaft sprockets 3 & 4 timing marks align to VS130/02 Timing Gauge and adjust again if necessary.

**Repeat procedure until marks align.**

3.4.7. Install Timing Gauge VS130/02 into camshaft sprockets 1 & 2, and ensure sprocket, timing cover and timing gauge marks align using the upper belt guide to adjust if **BEFORE** or **AFTER** as per the previous procedure employed with 3 & 4 sprockets timing.

3.4.8. After each adjustment always remove tools, rotate engine, return to crankshaft TDC and re-lock with VS130/01. Re-check sprocket timing marks alignment with VS130/02 Timing Gauge. **All crankshaft and camshaft timing marks must align exactly**



### 3.5. FINAL TENSIONING OF THE BELT

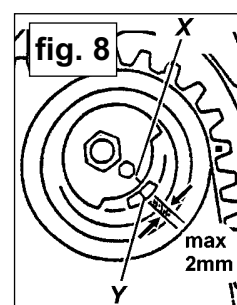
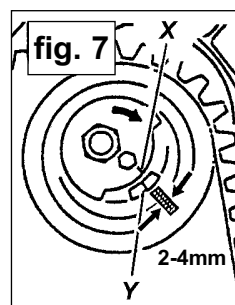
3.5.1. Re-lock crankshaft at TDC with VS130/01. Loosen the belt tensioner and turn **clockwise** until mark 'X' is 2 to 4mm **ABOVE** mark 'Y' (fig.7). Re-tighten to 20 Nm.

3.5.2. Remove crankshaft locking tool, rotate crankshaft twice, returning the crankshaft mark to TDC, and re-lock with VS130/01.

3.5.3. Re-check tensioner - **Mark 'X' should be a maximum of 2mm ABOVE mark 'Y' (fig.8).** **WARNING! DO NOT LET 'X' LIE BELOW 'Y'.**

3.5.4. Repeat procedure until correct tension marks are achieved.

3.5.5. Ensure all timing marks align, remove all locking tools and refit all components.



**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 product.


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

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