

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.

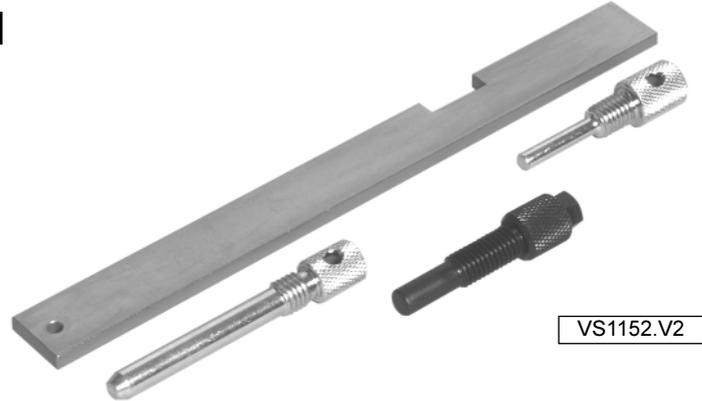


**IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS, AND CAUTIONS. USE THIS PRODUCT CORRECTLY, AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY.**

## 1. SAFETY INSTRUCTIONS

- ✓ Maintain the tools in good and clean condition for best and safest performance.
- ❑ **WARNING!** Ensure that all Health & Safety, local authority and general workshop practice regulations are strictly adhered to when using these tools.
- ✗ **DO NOT** use tools if damaged.
- ❑ **WARNING!** Incorrect or out of phase camshaft timing can result in contact between valve head and piston crown, possibly causing damage to the engine.

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



VS1152.V2

## 2. INTRODUCTION & APPLICATION

Setting engine timing on all current Ford 16v, Twin Camshaft engines (Zetec/Duratec) requires the tools included in VS1152.V2 Set. Additionally, replacement of the timing belt requires the crankshaft pulley to be removed and therefore Associated Tools VS1013 or VS4736 are needed, depending upon engine type.

### 2.1 APPLICATIONS

#### 2.1.1 FORD

Twin Cam 16v.

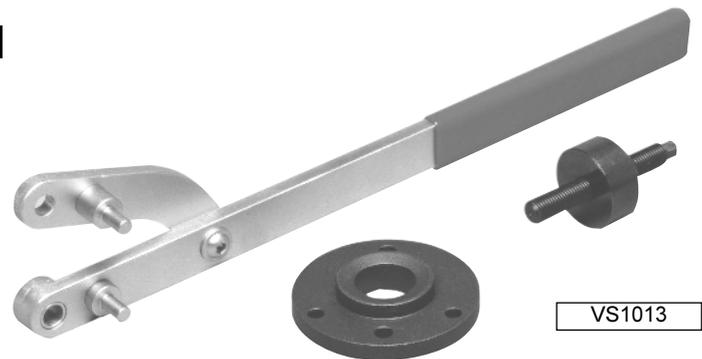
Petrol engines in:

Puma	Escort	Fiesta/Fusion
Focus	Mondeo	Cougar

#### 2.1.2 MAZDA

121

Refer to the Application Chart (section 4) for specific model information.



VS1013

## 3. CONTENTS & ASSOCIATED TOOLS

### ITEM PART NO. DESCRIPTION

**VS1152.V2 SETTING/LOCKING TOOL SET**

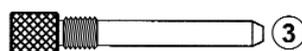
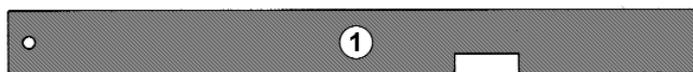
**COMPRISES OF ITEMS 01-04:**

- |    |           |                             |
|----|-----------|-----------------------------|
| 01 | VS115/01  | CAMSHAFT SETTING PLATE      |
| 02 | VS115/02  | CRANKSHAFT TDC LOCATION PIN |
| 03 | VS115/03  | CRANKSHAFT TDC LOCATION PIN |
| 04 | VS3032/21 | CRANKSHAFT LOCKING PIN      |

**VS1013 CRANKSHAFT PULLEY REMOVER & INSTALLER**

**COMPRISES OF ITEMS 05-07:**

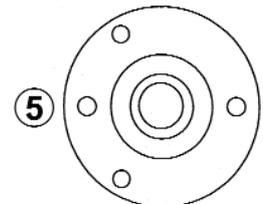
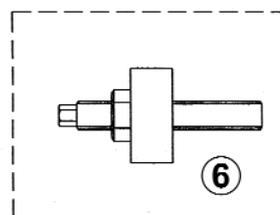
- |    |           |               |
|----|-----------|---------------|
| 05 | VS1013/01 | REMOVAL PLATE |
| 06 | VS1013/02 | INSTALLER     |
| 07 | VS1013/03 | HOLDING TOOL  |



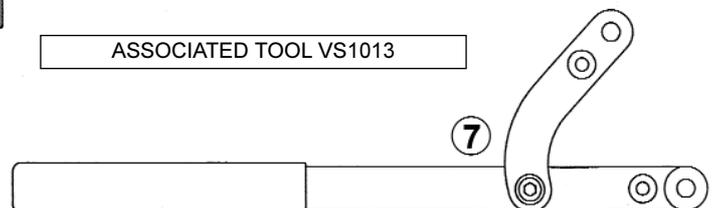
VS1152.V2



VS4736



ASSOCIATED TOOL VS1013



## 4. OPERATING INSTRUCTIONS

Models/engines	VS1152.V2 Kit Tools				Associated Tool Crank Pulley Hold Remover/Installer	
	VS 115/01	VS 115/02	VS 115/03	VS 3032/21	VS1013	VS4736
<b>Petrol Twin Cam 16v. engines Ford (Zetec/Duratec)</b>						
<b>Fiesta 1.6i/XR2i/RS1800</b>	●					
<b>Fiesta 1.25/1.4/1.6 16v. (95-98)</b>	●	●			●	
<b>Fiesta 1.25/1.4/1.6 16v. (98-02)</b>	●	●		●	VS1013/02 Installer only	
<b>Fiesta/Fusion 1.4/1.6 16v. (02-)</b>	●	●		●		
<b>Escort/Orion 1.6i/1.8i 16v.</b>	●					
<b>Focus 1.4/1.6 16v.</b>	●	●			VS1013/03 Holder only	
<b>Focus 1.8/2.0 16v.</b>	●		●			
<b>Puma 1.4/1.6 (-7/98), 1.7 16v.</b>	●	●			●	
<b>Puma 1.4/1.6 16v. (7/98-)</b>	●	●			VS1013/03 Holder only	
<b>Mondeo 1.8/2.0 16v. (00-) Chain Drive</b>	●	●				●
<b>Mondeo 1.6/1.8/2.0 16v. (93-00), Cougar 2.0 16v.</b>	●		5/98-00			
<b>Mazda</b>						
121 1.25 16v.	●				●	

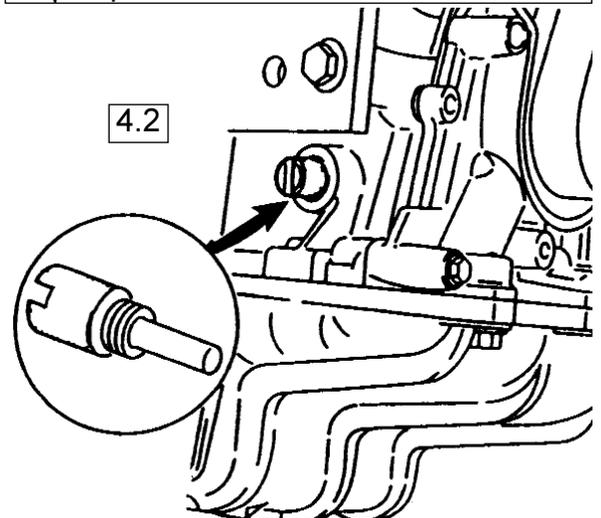
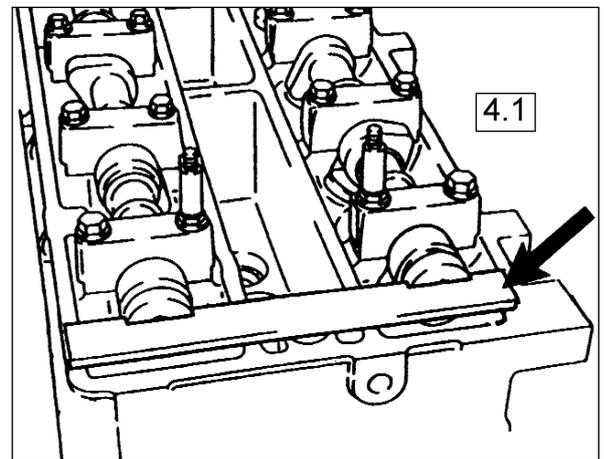
### 4.1 CAMSHAFT SETTING PLATE - VS115/01

- 4.1.1 On all current Ford 16v. twin cam engines (Zetec/Duratec), VS115/01 Setting Plate is used to lock the camshafts in the correct timing position via a slot at the rear of the camshafts.
- 4.1.2 For timing belt replacement on these applications it is important to ensure that the crankshaft is at TDC (see VS115/02 and VS115/03), and that VS115/01 Setting Plate is in position on the camshafts. The tensioner can then be slackened/compressed and the timing belt removed.
- 4.1.3 VS115/01 Setting Plate is also used on the latest Duratec HE chain drive twin cams.
- 4.1.4 With the setting plate locking the camshafts in position, the cam sprockets can be loosened, using a holding tool to counter-hold the sprocket whilst releasing the centre bolt. Some camshafts provide a hexagon to locate a spanner to counter-hold the camshaft.
- 4.1.5 Using the appropriate Location Pin ensure the crankshaft is at TDC before fitting new belt in an anti-clockwise direction. The tensioner should be applied following the manufacturer's procedure. Using a suitable Sprocket Holding Tool, counter-hold the camshaft sprockets whilst tightening the centre bolt.
- 4.1.6 Remove setting plate and TDC pin.
- 4.1.7 Rotate the engine a least two revolutions and return to TDC position inserting location pin. Re-check camshaft position by ensuring that VS115/01 Setting Plate can be easily inserted into its slots. If not, re-check tensioning procedure again.

**NOTE:** For Fiesta/Escort 1.6i/1.8i and Mondeo 1.6/1.8/2.0 (-98) 16v. engines, only VS115/01 Cam Setting Plate is used. A crank pin entry point is not provided.

### 4.2 CRANK TDC LOCATION PINS - VS115/02 & VS115/03

- 4.2.1 TDC Location Pins are used in conjunction with VS115/01 Cam Setting Plate to ensure correct timing position is established and maintained during engine timing applications on the following:
- VS115/02** - Fiesta/Fusion 1.25/1.4/1.6, Focus 1.4/1.6, Puma 1.4/1.6/1.7 16v, Mondeo 1.8/2.0 (chain) and Mazda 121 1.25 16v.
- VS115/03** - Focus 1.8/2.0 (98-02), Mondeo 1.6/1.8/2.0, Cougar 2.0 16v.



- 4.2.2 Remove the engine/crank blanking plug to allow the appropriate Location Pin to be screwed into position and then **carefully** rotate the crankshaft until the web **rests** against the pin.

**IMPORTANT:** These Location Pins are used to position the crankshaft. They **MUST NOT** be used to counter-hold the crank whilst releasing/tightening the crankshaft pulley bolt - see Crankshaft Pulley Removal & Installation.

#### 4.3 CRANKSHAFT PULLEY REMOVAL & INSTALLATION

Some engines do not have a keyway/woodruff key on the crank shaft to position the pulley. In these cases pulleys can be friction fit or on a taper on the crank and retained by 'stretch bolts'. There are a number of tools/methods employed to hold the crank pulleys whilst they are being installed, dependant upon engine - see application chart.

#### 4.4 CRANKSHAFT LOCKING TOOL VS3032/21

- Fiesta/Fusion Zetec SE/Duratec (98-) Focus 2.0 Duratec ST & RS

- 4.4.1 VS3032-21 is screwed into the side of the engine and the crank shaft turned in the normal direction of rotation until the crankshaft web rests against the tool. This provides the counter-holding position whilst the pulley bolt is released/tightened.

#### 4.5 CRANKSHAFT PULLEY REMOVER & INSTALLER SET - VS1013

- Associated Tool, not in VS1152.V2 Set.

- 4.5.1 Comprises:

VS1013/01 Pulley Removal Plate.

VS1013/02 Pulley Installer.

VS1013/03 Holding Tool.

- Fiesta (95-02), Focus 1.4/1.6 and Puma.

**NOTE:** On the smaller engines in Fiesta, Puma and Focus, specialised tools are required to remove and/or install the crankshaft pulley.

#### 4.6 CRANKSHAFT PULLEY REMOVAL PLATE - VS1013/01

- 4.6.1 VS1013/01 Removal Plate is used in conjunction with VS1013/03 Holding Tool to remove crank pulleys on certain Fiesta/Puma engines (-7/98), see application chart.

- 4.6.2 The Removal Plate is bolted onto the pulley and is subsequently prevented from rotating by Holding Tool VS1013/03. As the pulley centre bolt is unscrewed it reacts on the Removal Plate to withdraw the pulley off the crankshaft.

- 4.6.3 Lubricate the 'bolthead running surface' of VS1013/01 Removal Plate and bolt it onto the pulley (2 bolts) with the running surface against the domed head of pulley centre bolt.

#### 4.7 HOLDING TOOL VS1013/03

- 4.7.1 Locate the two pegs of VS1013/03 Holding Tool in to the remaining two holes in the VS1013/01 Removal Plate and use it to counter-hold the plate and pulley to prevent turning whilst unscrewing the pulley centre bolt. As the bolt is unscrewed it pushes the Removal Plate forward and this in turn draws the pulley off the crankshaft.
- 4.7.2 On some later engines VS1013/03 Holding Tool is used without the removal plate. Use the end holes of the Holding Tool and bolt it directly on to the pulley. Use to counter-hold whilst releasing the pulley bolt - see application chart.

#### 4.8 CRANK PULLEY INSTALLER VS1013/02

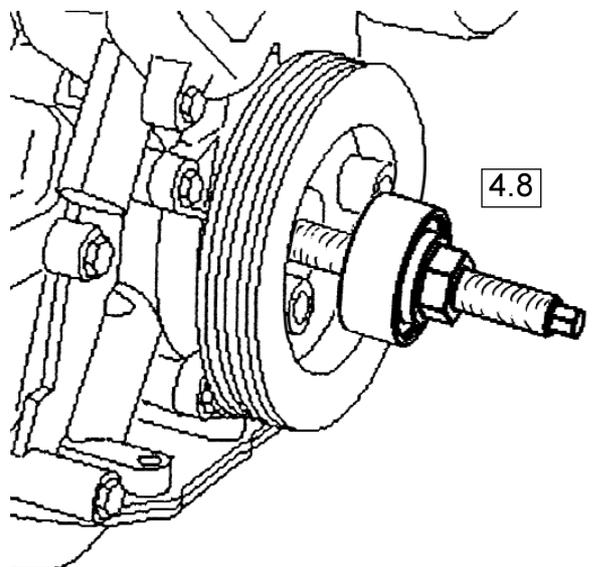
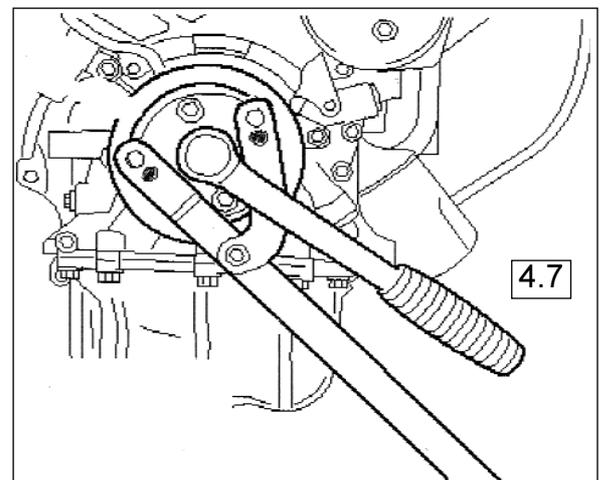
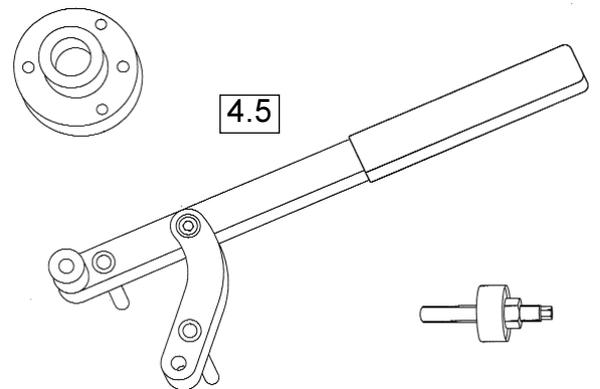
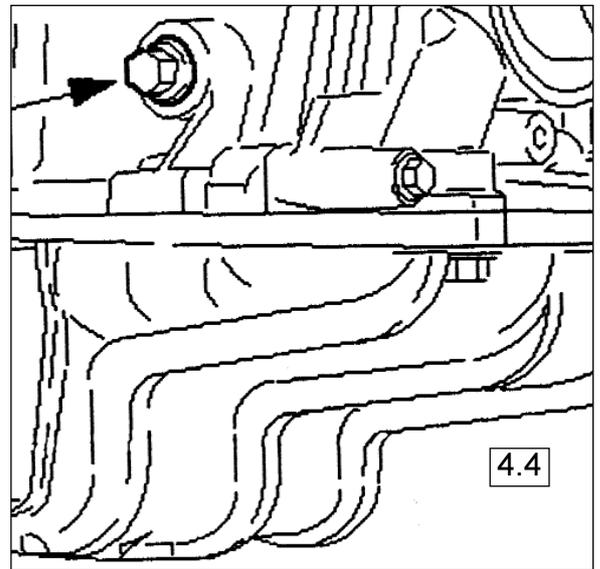
- 4.8.1 Replacing the crankshaft pulley on certain Fiesta, Puma and Focus engines requires specialised Installer VS1013/02 - see application chart.

**IMPORTANT:** A new pulley centre bolt is always required.

- 4.8.2 The pulley **MUST NOT** be pressed on using the centre bolt as this results in the torque specification for the bolt being achieved before the pulley is fully installed. Use VS1013/02 Installer to press the pulley fully onto the shaft and then fit the new centre bolt.

- 4.8.3 Place the pulley on shaft and screw the Installer Centre Screw into the shaft thread. Screw on the Force Nut Assembly and holding the end of the Centre Screw with a socket, turn the Force Nut to install the pulley.

- 4.8.4 Remove VS1013/02 and counter-hold the pulley with Holding Tool VS1013/03 whilst installing a new centre bolt to 40Nm + 90°.



#### 4.9 CRANKSHAFT PULLEY HOLDING TOOL VS4736

-Associated Tool - not in VS1152.V2 Set.

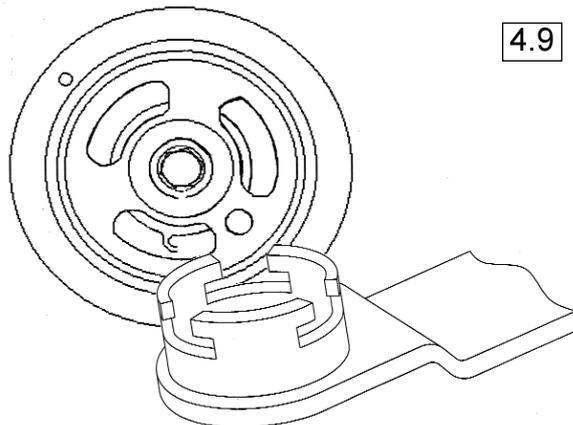
- Mondeo 1.8/2.0 16v. (Duratec HE) Chain Drive engine.

4.9.1 VS4736 Holding Tool locates into the slots in the crankshaft pulley to counter-hold it whilst the pulley bolt is released or tightened.

4.9.2 The crankshaft pulley and crank position rotor are combined. The pulley is secured to the crankshaft by contact pressure of its centre bolt, and is located in its correct position by means of an M6 bolt.

**IMPORTANT:** The M6 bolt MUST NOT be used to counter-hold the pulley whilst tightening the centre bolt or damage to the timing cover will result.

The centre bolt washer must be a minimum of 5.5mm thick or a friction washer must be used. The centre bolt is tightened to 100Nm + 90°.



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