

Issue: 01
Issue Date: 040506

ITEM	PART NO.	DESCRIPTION
1	VS4412	CAMSHAFT SETTING PLATE
2	VS4413	TENSIONER RETAINING PINS - 2 PART
3	VS4414	PUMP REMOVER & SPROCKET RETAINER - 2 PART
4	VS118/02	TDC LOCATION PIN
--	VS4411.84	CASE AND INSERT (NOT SHOWN)

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.

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.

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.
- DO NOT** attempt to start engine or move vehicle whilst in gear with any devices fitted.
- Always display warning notification on steering wheel when locking engine components.
- 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.

2. INTRODUCTION & APPLICATIONS

2.1 Introduction

VS4411 Timing Kit includes the camshaft setting plate and crankshaft TDC location pin required to 'set' and 'lock' the engine in its correct timing position. The kit also provides camshaft and injection pump chain tensioner retaining pins and the essential injection pump remover which is used when removing sprockets and/or chains as well as the injection pump. This tool is additionally used to retain and support the sprocket and timing chains in position when the pump has been removed.

2.2 Applications:

BMW M41/M51 diesel engines fitted in:-

BMW:
318tds, 325, 525 and 725td/tds

LAND ROVER:
Range Rover 2.5DT/SE (94-)

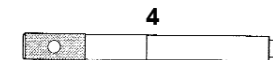
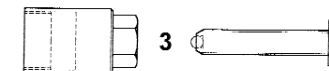
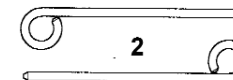
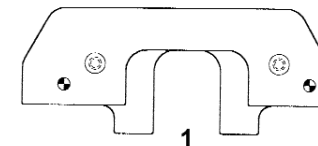
VAUXHALL-OPEL:
Omega-B 2.5TD (OHC25TD)

3. CONTENTS

- 1 VS4412 Camshaft Setting Plate
- 2 VS4413 Tensioner Retaining Pins (2)
- 3 VS4414 Main Body and Force Screw of Pump Remover and Sprocket Retainer
- 4 VS118/02 TDC Location Pin

Associated Tool

- VS4415 Tensioner Lever



4. INSTRUCTIONS

WARNING: These timing tools must NOT be used to counterhold the crank or camshaft for removing/releasing pulleys or sprockets. They are for retention of engine timing position only. Use appropriate Holding Tool.

4.1. Checking Timing

With the crankshaft 'locked' at TDC with VS118/02 Pin, the camshaft lobes above No.6 cylinder will be in TDC position and pointing approx. 45° upwards. Cam lobes above No.1 cylinder will be pointing vertically upwards.

4.2. VS4412 Camshaft Setting Plate (Fig.1)

The accuracy of the camshaft timing position is confirmed by locating VS4412 Setting Plate onto the flats of the camshaft.

For M41 or engines with timing chains which are new or have covered less than 12,500 miles (20,000 km), VS4412 Setting Plate must rest fully on the surface of the cylinder head.

For M51 engines only, when re-using timing chains which have covered more than 12,500 miles (20,000 km), **there should be a clearance, on one side, between the cylinder head and plate.** This clearance corresponds to a 2° angle and is checked using a 4.5mm feeler gauge (Fig.2).

4.3. VS118/02 Crankshaft TDC Location Pin (Fig.3)

VS118/02 Pin is used to 'lock' the crankshaft/flywheel at TDC. A timing hole is provided in the left-hand corner of the cylinder block.

IMPORTANT: Always turn engine in direction of normal rotation. Turn crankshaft to slightly before TDC and insert VS118/02 Pin through timing hole and turn crankshaft carefully until pin enters hole in flywheel.

4.4. VS4413 Tensioner Retaining Pins Set (Fig.4)

Both Tensioner Pins are used to retain the lower chain tensioner when removing it and the tensioner arm to facilitate removal of the timing chain, injection pump, timing case etc.

WARNING: Tensioner pistons will be under spring pressure. DO NOT remove pins until all parts are re-installed.

A VS4413 Pin is also used in conjunction with Lever VS4415 (Associated Tool - not in kit), for release of tension on the camshaft timing chain.

4.5. VS4414 Injection Pump Remover & Sprocket/Chain Retainer (Fig.5)

The VS4414 Injection Pump Remover & Sprocket/Chain Retainer is an essential tool when removing the fuel injection pump or timing chains/sprockets.

Remove inlet manifold, fuel pipes, viscous fan and pump securing nuts and support bracket bolt.

Remove the blanking plug from the auxiliary belt tensioner to give access for the main body to be threaded onto the injection pump sprocket.

Remove injection pump sprocket securing nut and thread main body (without force screw) onto sprocket. Fit and operate force screw to remove pump.

NOTE: VS4414 remains in place to retain/support the sprocket and timing chains.

Fig.1

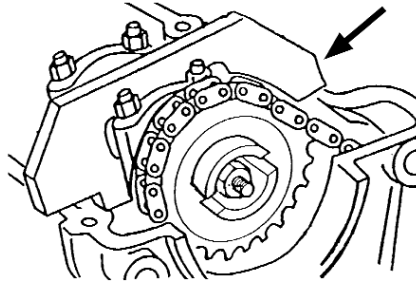


Fig.2

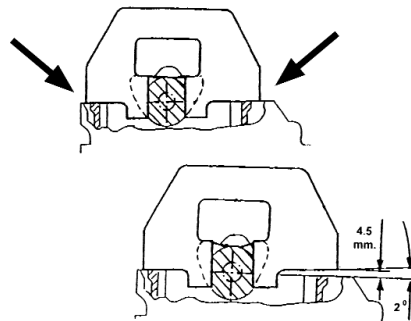
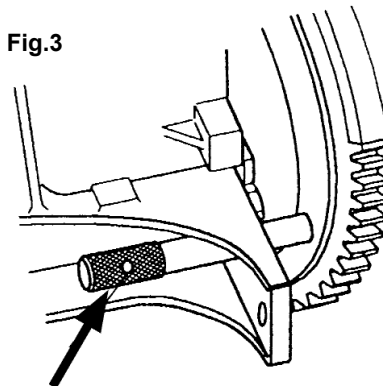


Fig.3



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When removing the pump, ensure that the woodruff key does not become detached and fall into the engine. When refitting the pump, the keyway/groove in the pump and sprocket must point upwards.

4.6. Fuel Injection Pump - Checking / Adjusting Timing

Fuel injection pump timing is checked and adjusted using the VS1079 Bosch Rotary Pump Timing Tool Kit. The crankshaft is 'locked' at TDC using VS118/02 Location Pin.

Remove the service port plug located in the centre of the outlet pipes at the rear of the injection pump and fit VS1079 to check that the pump timing is correct.

DTI reading should be:

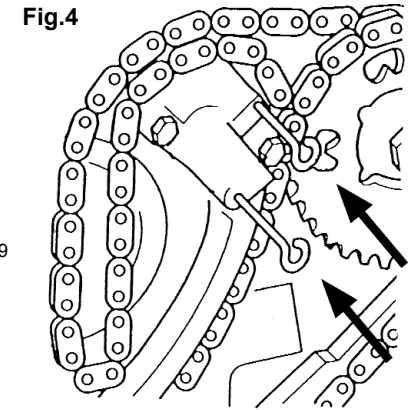
0.93 - 0.97mm for new chains

0.88 - 0.92mm for chains over 12,500 miles (20,000 km)

- see VS1079 Data Sheet for detailed instructions for use.

To adjust injection pump timing, slacken pump mounting nuts and bracket bolt and rotate pump to obtain correct reading on DTI.

Fig.4



4.7. VS4415 Tensioner Lever (Fig.7)

Associated Tool - not in kit

VS4415 Tensioner Lever is positioned inside the cam timing chain cover and levered against the chain bow to press in the chain tensioner (Fig.6).

The drain plug is removed to allow Pin VS4413 to be inserted to 'lock' the chain tensioner in position.

Fig.5

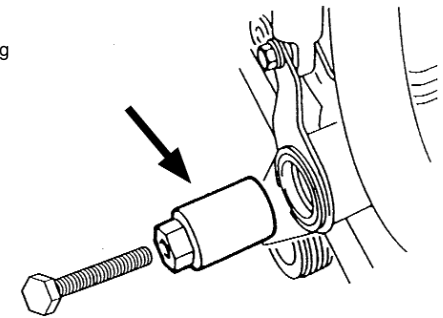


Fig.6

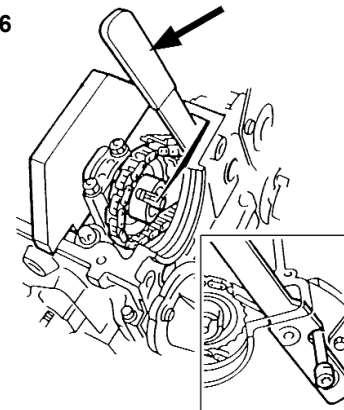
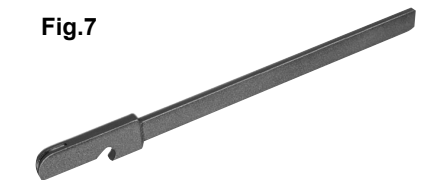


Fig.7



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