

DIESEL ENGINE SETTING/LOCKING TOOL KIT FOR VAUXHALL/OPEL 2.0Di/2.2Di

1. INTRODUCTION & APPLICATIONS

1.1. INTRODUCTION

VS131 Setting/Locking Tool Kit includes the Camshaft Setting Tool to 'lock' the camshaft in its correct timing position, a Crankshaft Locking Pin and Injection Pump Locking Pin.

Additionally the kit includes the essential Timing Adjustment Assembly required to adjust and fix pump timing/cam sprocket position during the engine timing procedure.

1.2. APPLICATIONS

Vauxhall/Opel: Astra, Astravan, Zafira, Vectra, Omega, Sintra, Frontera
 X20DTL / X20DTH / X22DTH 2.0Di and 2.2Di EcoTec diesel engines

Saab: 9-3 2.2D Turbo (98-)

2. 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.

WARNING! Incorrect or out of phase camshaft timing can result in contact between the valve head and the piston crown causing damage to the engine. Incorrect injection pump timing may cause excessive smoke emissions, poor starting and low power output.

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.

3. CONTENTS & ASSOCIATED TOOLS

3.1. Contents

- | | |
|------------------------------------|--|
| 1. VS131/01 Camshaft Setting Tool | 3. VS131/03 Injection Pump Locking Pin |
| 2. VS131/02 Crankshaft Locking Pin | 4. VS131/04 Timing Adjustment Assembly |

3.2. Associated Tools

Vauxhall/Opel Timing Tools

Diesel Engine Fuel System Priming Device - Vaux/Opel 2.0Di/2.2Di VS055

Diesel Engine Setting/Locking Tool Kit - Vaux/Opel 1.6D/1.7D VS114

Diesel Engine Cam Locking Assy - Vaux/Opel 1.6D/1.7D VS1065

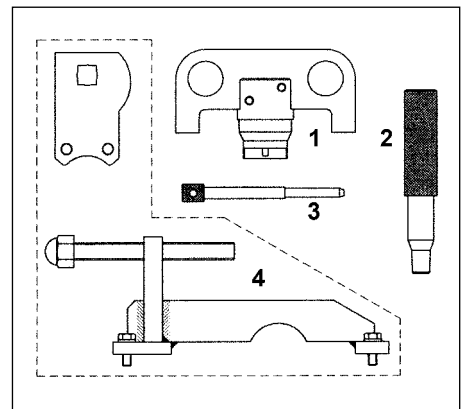
Petrol Engine Twin Cam Setting/Locking Tool Kit - Vaux/Opel 1.0/1.2 VS132

Petrol Engine Twin Cam Tensioner Set - Vaux/Opel 1.0/1.2 VS133

Petrol Engine Setting/Locking Tool Kit - Vaux/Opel V6 VS130

Petrol Engine Twin Cam Locking Tool - Vaux/Opel 1.4/1.6 VS1702

Petrol Engine Twin Cam Locking Tool - Vaux/Opel 1.8/2.0/2.2 VS1701



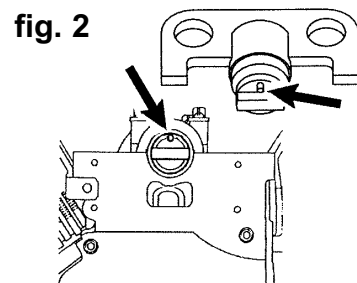
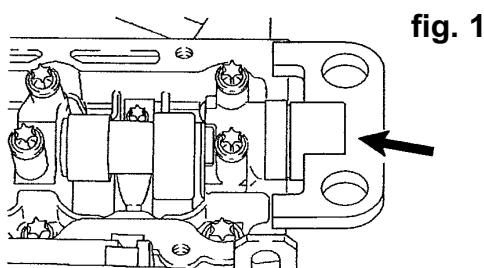
4. INSTRUCTIONS

The correct engine 'timing' position will need to be re-established whenever service work requiring cylinder head removal, camshaft/valve train adjustment, or major engine repair has been carried out.

IMPORTANT: With the 1st cylinder at TDC, the timing position is correct only when the Crankshaft Pin, Injection Pump Pin and Camshaft Setting Tool can all be installed on the engine.

4.1. VS131/01 Camshaft Setting Tool

VS131/01 is used to 'set' the camshaft in its timed position by locating into the horizontal slot machined at the back of the camshaft (fig. 1). The locating pin on the tool should be uppermost and **MUST** engage correctly into the locating hole in the camshaft (fig. 2).



4.2. VS131/02 Crankshaft Locking Pin

VS131/02 is used to position the crankshaft at TDC. It is inserted through the crankshaft pulse pick-up opening in the cylinder block (fig. 3) and engages in a 'slot' provided on the crankshaft.

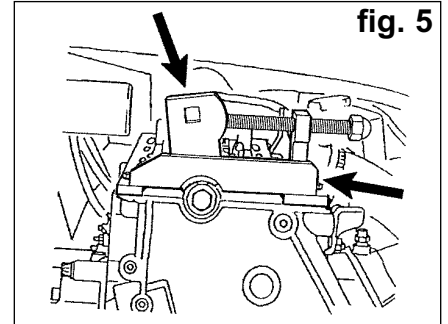
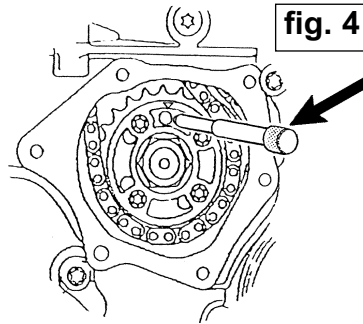
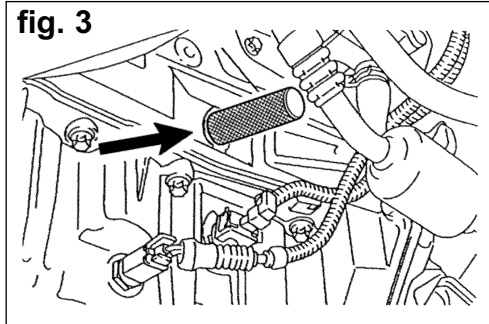
4.3. VS131/03 Injection Pump Locking Pin

VS131/03 aligns to a timing mark on the simplex injection pump sprocket and enters a recess in the injection pump flange and pump retaining bore (fig. 4).

IMPORTANT: The Locking Pin MUST enter the bores smoothly and slide in and out easily.

All three tools must locate in their positions correctly when conducting an engine timing check - also see 4.6. Timing Adjustment.

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



4.4. VS131/04 Timing Adjustment Assembly

VS131/04 comprises a cam sprocket attachment and a timing adjustment fixture. It is mounted onto the cylinder head and used to adjust the pump sprocket timing through action to the simplex chain and camshaft sprocket - see 4.6. Timing Adjustment.

4.5. Timing Check

4.5.1. Remove air filter housing, cylinder head cover, vacuum pump, belt tensioner, front exhaust.

NOTE: Carefully remove timing case cover.

4.5.2. Turn engine to a position just prior to 1st cylinder TDC. Pulley mark will be just in front of timing case pointer.

4.5.3. Remove crankshaft pulse pick-up, with O-ring, and insert VS131/02 Crankshaft Locking Pin. Turn engine slowly to TDC until the Pin fully engages into the slot in crankshaft.

IMPORTANT: The timing marks on the pulley and timing case MUST align and the 'arrow' timing mark on the simplex injection pump sprocket MUST align with the holes in the pump flange and pump.

4.5.4. Insert VS131/03 Injection Pump Locking Pin and ensure it enters easily and can slide in and out smoothly, if it cannot - see 4.6. Timing Adjustment.

4.5.5. Install VS131/01 Camshaft Setting Tool into 'slot' in rear of camshaft. Location pin **MUST** be uppermost and enter the locating hole in the camshaft easily.

IMPORTANT: For engine timing to be correct, it must be possible to install all the above timing tools in their positions on the engine - if any or all cannot be fitted refer to 4.6. Timing Adjustment.

4.6. Timing Adjustment

When the crankshaft is 'locked' at TDC using Pin VS131/02 but VS131/03 Injection Pump Pin cannot be inserted smoothly, timing adjustment of the engine is necessary.

4.6.1. Lock the crankshaft at TDC using VS131/02 and remove both the simplex and duplex chain tensioners, noting their assembly sequence.

NOTE: When re-installing chain tensioners, the release bolt should be depressed until a 'click' is heard. Then pressed in and allowed to slide back to its original position until oil pressure has built up and it is not possible to depress the bolt.

4.6.2. Remove camshaft sprocket bolt, counter-holding the camshaft with a spanner. Fit new bolt but only hand-tighten so sprocket is free but not tilting.

4.6.3. Release the simplex injection sprocket bolts and align the 'arrow' timing mark on the sprocket with the holes in the pump flange and pump.

4.6.4. Insert VS131/03 Locking Pin and install the duplex chain tensioner.

4.6.5. Remove Pin VS131/03 to tighten the simplex injection pump sprocket bolts.

4.6.6. Re-Insert Pin ensuring it enters easily and slides in and out smoothly.

4.6.7. Install Cam Setting Tool VS131/01 in the rear slot of the camshaft with the locating pin uppermost. If necessary, turn camshaft using spanner.

4.6.8. Insert the sprocket attachment of VS131/04 vertically, locating it into the holes of the cam sprocket and bolt the timing fixture onto the cylinder head (fig. 5).

4.6.9. Fit a 1/2" sq. drive ratchet to the sprocket attachment and apply slight pressure in an anti-clockwise direction (against engine rotation). Retain it in this position by turning the adjustment screw of the fixture, by hand, until it meets the attachment.

4.6.10. Check that Pump Locking Pin VS131/03 can still be removed and installed smoothly. If not, adjust pressure by carefully altering the fixture adjustment screw position.

4.6.11. Tighten camshaft sprocket bolt to specified torque and install simplex chain tensioner.

4.6.12. Remove all timing/adjustment tools and carefully rotate engine by hand.

4.6.13. Return to TDC and re-insert all timing tools as per 'Timing Check' procedure above, to ensure timing is correct.

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 responsibility is accepted for incorrect use of this equipment.

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

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