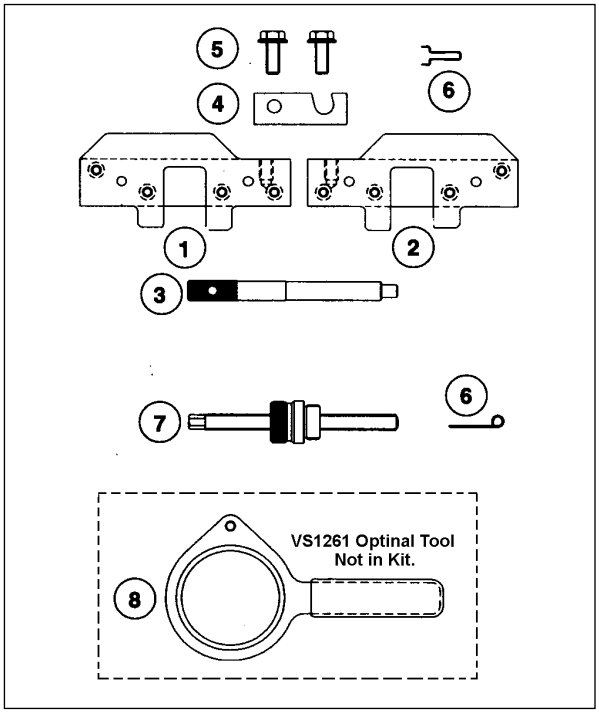
SEALEY Professional TOOLS
AUTO SERVICE LINE

VS126

PETROL ENGINE TWIN CAMSHAFT SETTING/LOCKING TOOL KITS.
For BMW DOHC Chain Drive engines & VANOS Variable Timing Control System



STANDARD PARTS LIST

1	VS126/01	L.H. PLATE ASSEMBLY
2	VS126/02	R.H. PLATE ASSEMBLY
3	VS118/02	CRANK LOCKING PIN
4	VS126/04	LATCH PLATE
5	VS126/05	LATCH BOLT (2)
6	VS126/06	TENSION TOOL SET (2 PARTS)
7	VS126/07	PRELOAD TOOL (3 PARTS)
8	VS1261	ENGAGEMENT WRENCH (OPTIONAL TOOL)

1. INTRODUCTION & APPLICATION

1.1. INTRODUCTION

VS126 Setting/Locking Tool Kit includes the special Twin Cam Setting Plate assembly required to 'set' and 'lock' the pair of camshafts in their correct timing position. It also includes the Crankshaft TDC Location Pin and Secondary Chain Tensioner Tool. All tools which are essential when carrying out service work requiring cylinder head, timing chains/sprocket or camshaft removal on the M42/M44/M50 DOHC engines.
VS126 Kit also includes the special Primary Timing Chain Preload Tool required when setting timing on M50/M52 engines with the VANOS variable camshaft timing control system introduced from Sept '92.

1.2. APPLICATION

M42/M44 4cyl. 1.8/1.9 DOHC engines.
M50 6 cyl. 2.0/2.5 DOHC non-VANOS engines.
M50/M52 VANOS engines.

1.3. USE PRODUCT WITH THE FOLLOWING TOOLS

VANOS Unit Engagement Wrench VS1261
VISCOUS Fan Wrench VS092
VISCOUS Fan Hub Holding Wrench VS095

1.4. ASSOCIATED TOOLS & APPLICATIONS

Petrol Engine Setting/Locking Tool Kit BMW M40/M43 engines. VS118

2. APPLICATION DETAILS

BMW

316iS/318 Ti Compact (91-) 320/325i, 520i/525i, with M42, M44 and M50 (-92) engines.	All tools in kit except VS126/07
M3 (92-), 320i/323i/328i, 520i/523i/528i, with M50 VANOS, S50, M52/S52 (92-) engines.	All tools in kit plus optional VS1261

3. SAFETY INSTRUCTIONS

❒ **WARNING!** *Ensure all health and safety, local authority, and general workshop practice regulations are strictly adhered to when using tools.*
✗ DO NOT use tools if damaged.
✓ Maintain the tool 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, locking bolts, pins and parts being used and do not leave them in or near the engine.
▲ **IMPORTANT:** Always ensure the timing chains are preloaded when checking position of the camshafts.
❒ **WARNING!** *The primary chain tensioner has a strong spring and care must be taken when unscrewing the tensioner.*

4. INSTRUCTIONS FOR USE.

❒ **WARNING! Ensure you have read and understood chapter 3 safety instructions before commencing.**
❒ **WARNING!** *Incorrect or out of phase camshaft timing can result in contact between the valve head and the piston crown causing possible damage to the engine.*

▲ **IMPORTANT:** 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 .

4.1. TDC SETTING AND LOCKING M42/M44/M50/M50 VANOS/M52 ENGINES.

The Twin Camshaft Setting/Locking Plate and Crankshaft TDC Location Pin are used to ensure accurate alignment of the twin camshafts and crankshaft and to 'lock' these in TDC position when, for example, replacing timing chains, camshaft sprockets, tensioners or any engine repairs requiring cylinder head removal.

4.1.1. Twin Camshaft Setting/Locking Plate.

The Camshaft Position.

With the crankshaft 'locked' at TDC with Pin VS118/02, the timing arrows on the camshaft sprockets should be pointing vertically upwards. The front cam lobes on both camshafts should face each other. The sides of the square flanges at the back of the camshafts must be exactly at right angles to the top surface of the cylinder head and the with the drilled hole uppermost. The accuracy of this camshaft position is determined by placing the Twin Plate Assembly over the square flanges (fig 1).

▲ **IMPORTANT:** Ensure the plate fits exactly over the flanges and rests fully on the surface of the cylinder head.

NOTE: on M50 engines, remove the cover studs to allow a flat surface for the plate.

▲ **IMPORTANT:** DO NOT use setting plate to counter-hold camshafts. Use suitable spanner on hexagons/flats provided, (i.e. between cams 5 & 6 on M42) to turn camshafts, or to counter-hold to remove sprocket bolts.
Machine away the spanner sides to avoid any damage to the engine casing.

4.1.2. The Twin Setting Plate Assembly.

The Plate Assembly is designed as a LH and RH pair which can be positioned separately onto their appropriate camshafts and then 'latched' and bolted firmly together. It can also be left in place to ensure no movement of the camshaft occurs during service work.

❒ **WARNING!** *If either the chain tensioners or timing chains are removed, the camshafts MUST NOT be turned as piston to valve contact will be made resulting in engine damage. Remove the crankshaft and camshaft locking tools and turn crankshaft 30 degrees clockwise away from TDC position before camshafts are turned.*

4.1.3. VS118/02 Crankshaft TDC Location Pin.

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. Access is improved by removing viscous fan/cowl using VS092 Wrench and VS095 Holding Tool.

1. Turn crankshaft clockwise until arrows on camshaft sprockets point upwards
2. Insert VS118/02 Pin through timing hole and turn crankshaft slightly until pin enters hole in the flywheel (fig 2).

fig 1.

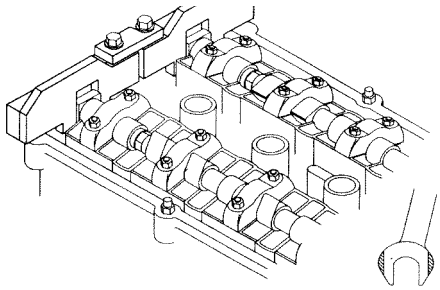
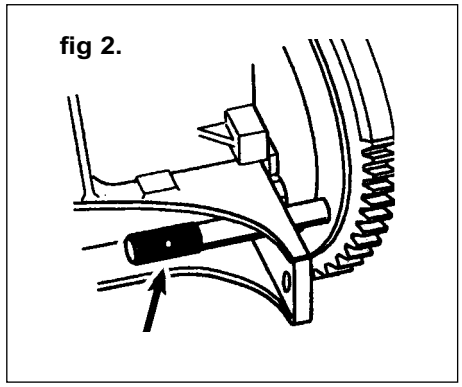
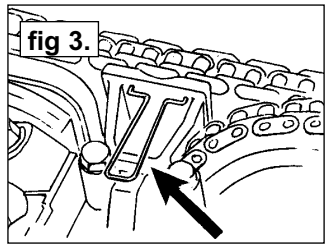


fig 2.



4.2. TIMING CHAIN TENSIONERS M50/M50 VANOS / M52 ENGINES.

Removal of timing chains, (both primary and secondary), sprockets, camshafts and cylinder head will involve removal of the chain tensioners and subsequent adjustment to the correct final position of camshaft sprockets via the tensioners.



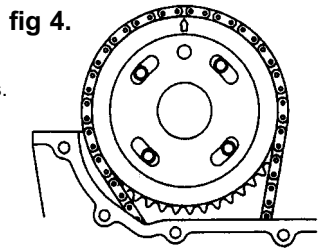
4.2.1. VS126/06 Secondary Chain Tensioners

Removal of the secondary timing chain/cam sprockets requires removal of the primary chain tensioner.

❒ **WARNING!** ***The primary chain tensioner has a strong spring and care must be taken when unscrewing the tensioner.***

Use VS126/06 to lock down the secondary timing chain tensioner as follows:

1. Press down the tensioner pad and insert VS126/06 to hold in position (fig 3).
2. When the engine is 'locked' at TDC with Twin Plate Assembly and VS118/02 Pin, counter-hold camshaft with spanner and undo the cam sprocket bolts to remove both secondary chain and sprockets.
3. When reassembling, and with the engine 'locked' at TDC the exhaust camshaft primary chain sprocket must be positioned with the timing arrows pointing vertically upwards and the tapped holes in the camshaft flange set at the left hand ends of the elongated slots in the sprocket (fig 4).
4. The secondary timing chain and camshaft sprockets are then positioned on to the camshafts (with timing arrows pointing upwards), and securing bolts are screwed in finger tight only at this stage.

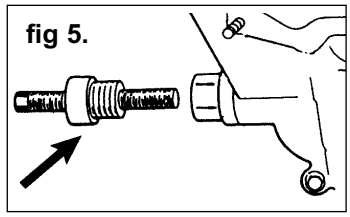


4.2.2. M50 non-VANOS engines.

1. Re-fit primary timing chain tensioner and tighten to specified torque. This will apply final adjustment to the primary chain exhaust sprocket.
2. Remove VS126/06 Tensioner Tool, recheck camshaft position with the Twin Plate Assembly.
3. Tighten exhaust and inlet sprocket bolts to specified torque.
4. Remove all locking tools.
5. Turn engine clock-wise two revolutions and recheck timing by locking crankshaft at TDC.
6. Check that camshaft sprocket timing arrows point vertically upwards, and that the Twin Setting Plate can be correctly fitted without turning the camshafts.

4.2.3. M50/M52 VANOS engines.

VS126/07 Preload Tool must be used to achieve final position of the primary exhaust sprocket.

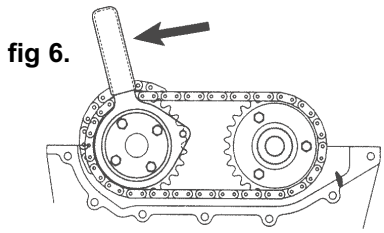


4.2.4. VS126/07 Primary Timing Chain Preload Tool - M50/M52 VANOS.

VS126/07 is required when refitting primary, secondary timing chains, camshaft sprockets and VANOS Adjustment Units.
When fitting the primary chain exhaust sprocket as described above, but on engines with the VANOS system, or, after refitting a VANOS Unit, the primary timing chain tensioner is removed and VS126/07 Preload Tool is screwed into the hole and its adjusting screw turned until it just touches the tension rail (fig 5). The primary chain exhaust sprocket will move anti-clockwise so that the tapped holes in the camshaft flange become centred in the elongated holes of the sprockets.

1. Use a torque wrench to apply 1.3 Nm. to the VS126/07 adjusting screw.
2. Tighten camshaft sprocket bolts to specified torques.
3. Remove VS126/06 and locking tools, rotate engine two turns and recheck timing position using twin setting plate and TDC pin, as above.

IMPORTANT: *Ensure the timing chains are preloaded when checking position of camshafts.*
NOTE: If locking tools cannot be inserted, timing position or VANOS Unit have not been set correctly and must be adjusted.
Remove VS126/07 and refit primary tensioner.



4.2.5. VS1261 VANOS Unit Engagement Wrench. (Optional: not included in kits).

VS1261 Wrench is used when removing or refitting VANOS Adjustment Units with plate springs.
VS1261 is attached to the exhaust camshaft sprocket to turn the sprocket and secondary timing chain for removal of the VANOS Unit (fig 6). When refitting, the Wrench assists turning the sprocket in a controlled manner, anti-clockwise until the VANOS spline shaft engages the internal splines of the inlet sprocket.

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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