

INSTRUCTIONS for: PETROL ENGINE SETTING/LOCKING KIT - VAG 1.4, 1.6 FSi & 1.4 TFSi - CHAIN DRIVE

MODEL No: **VS4845A**

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.



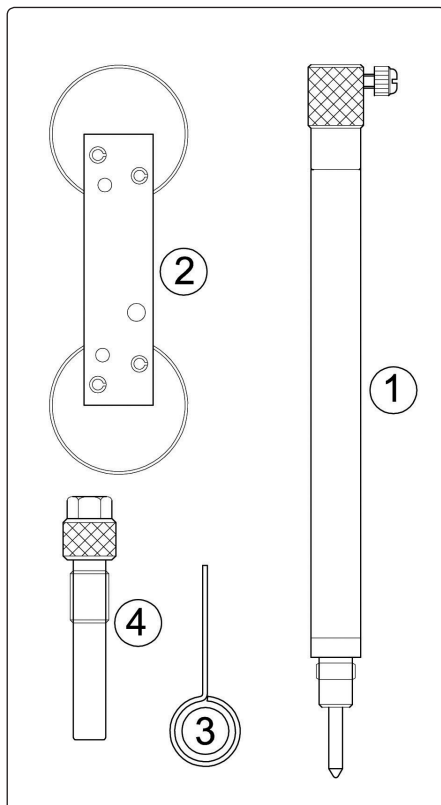
IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS AND CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP 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 a good, clean condition for the 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 locking devices fitted.
- Always** display warning notification on steering wheel when locking engine components.
- Account for all tools, locking bolts, pins and parts being used, **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. CONTENTS & APPLICATIONS

Designed for use on VAG 1.4 / 1.6 FSi and 1.4 TFSi (chain drive) petrol engines.



Item	Part No.	OEM No.	Description
1	VS1404	T10170	TDC Positioning Tool - (use with a suitable dial gauge)
2	VS4846	T10171	Camshaft Setting Plate
3	VS4593-1E	T40011	Tensioner Locking Pin
4	VS4851	T10340	Crankshaft Locking Pin

Applications:

**VW GROUP 1.4/1.6 FSi and 1.4 TFSi Petrol engines
- Chain Drive - fitted to:**

AUDI:

A3

SEAT:

Ibiza

Leon

Altea

SKODA:

Fabia II

Octavia

Roomster

Superb

VOLKSWAGEN:

Eos

Golf

Golf Plus

Jetta

Passat

Polo

Scirocco

Tiguan

Touran

FSi engine codes -

AXU, BAG, BKG, BLF, BLN, BLP and BTS

TFSi engine codes -

BLG, BMY, BWK, CAVA, CAVB, CAVC, CAVD, CAVE, CAVF, CAXA, CAXC, CDGA

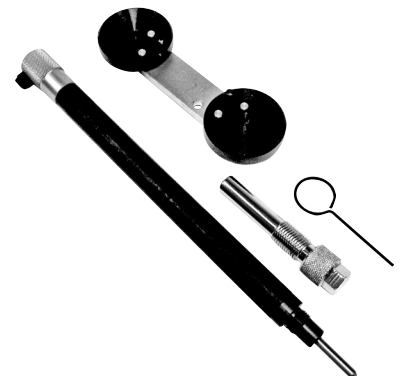
NOTE:

Additional tools required:

Camshaft Sprocket Holding Tool

Crankshaft Pulley Holding Tool

Dial Gauge



3. INSTRUCTIONS

3.1. Checking Valve Timing

3.1.1. Remove the air cleaner housing, exhaust gas recirculation valve and the cover plate at the rear of the camshafts.

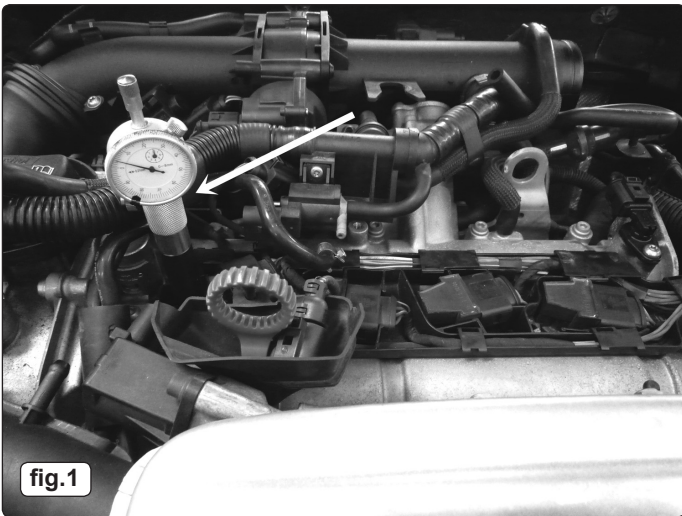
VS1404 TDC Positioning Tool (Use with suitable DTI). Correct engine/crankshaft TDC position is established using VS1404 TDC Tool together with a suitable DTI (Dial Gauge).

3.1.2. Remove the spark plug from No.1 cylinder.

3.1.3. Connect the DTI to VS1404 TDC Tool and secure with the thumbscrew.

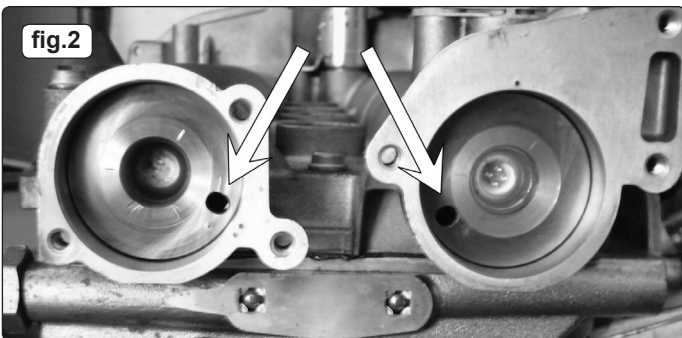
3.1.4. Screw VS1404 TDC Tool fully into the spark plug hole of No.1 cylinder (fig.1).

3.1.5. Turn the crankshaft in the normal direction of engine rotation so that the piston pushes on the indicator pin of VS1404 TDC Tool and in turn moves the needle of the DTI. TDC is achieved when the needle reaches its highest reading, and prior to it starting to move in the reverse direction.



3.1.6. **IMPORTANT:** Check that the holes in the rear of the camshafts are positioned as shown in fig.2. If they are not, turn the crankshaft one more turn (360°) and establish TDC No.1 cylinder position, using VS1404 TDC Tool and the DTI.

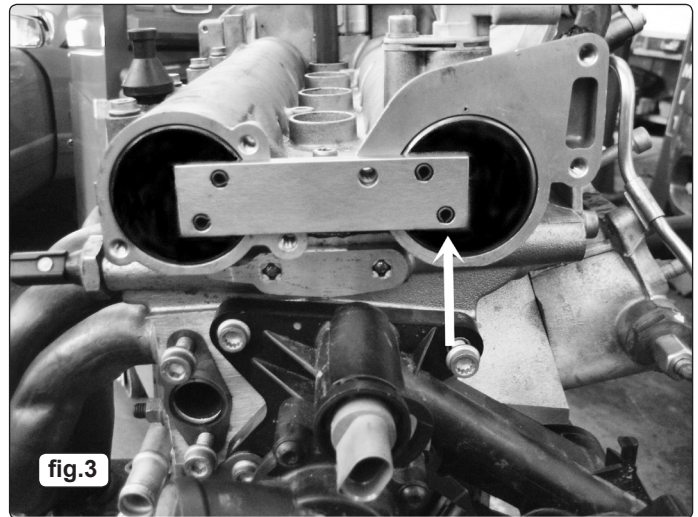
WARNING: Whilst establishing TDC on these engines, the crankshaft **MUST NOT** be turned or be allowed to move, more than 0.01mm past TDC position. If this occurs, turn the crankshaft backwards (against direction of rotation), approx. 45°, and then forward again to TDC No.1 cylinder position.



3.1.7. Insert VS4846 Camshaft Setting Plate into the recesses and the two holes in the rear of the camshafts (fig.3).

NOTE: 'TOP' marked on the centre bridge of the Setting Plate, must be at the top.

If VS4846 Setting Plate cannot be installed, the engine timing is incorrect and must be adjusted.



3.2. Adjusting Valve Timing

WARNING: On the rear face of the crankshaft gear is a raised lug (fig.4). This lug locates into a recess in the crankshaft, setting the position and providing a positive connection between gear and crankshaft. Care must be taken when refitting the crankshaft pulley centre bolt to ensure that the lug on the crankshaft gear is located into the recess in the crankshaft. Failure to do so could result in damage to the engine.

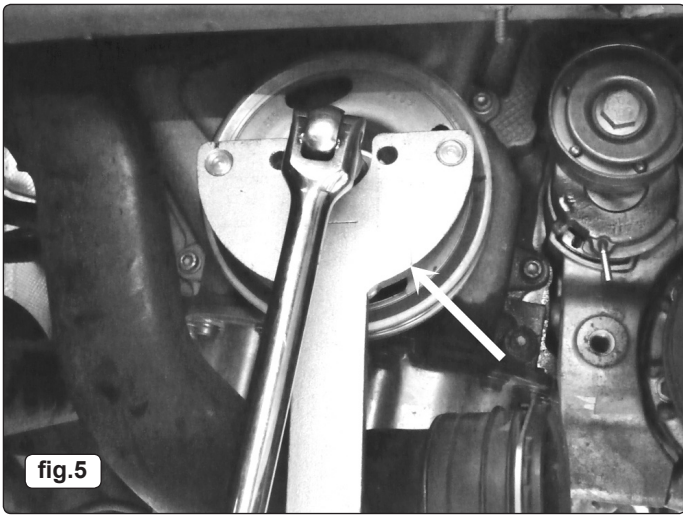


3.2.1. Using a Crankshaft Pulley Holding Tool as a counter-hold (tool not in set), release and remove the pulley centre bolt (fig.5).

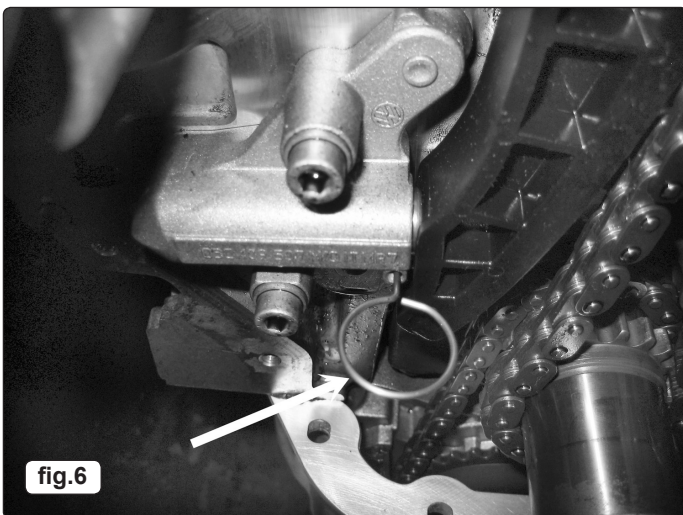
3.2.2. Remove the crankshaft pulley in order to remove the timing chain cover.

3.2.3. Refit the pulley and bolt (ensuring correct crank gear location on the crankshaft) to facilitate rotation of the engine.

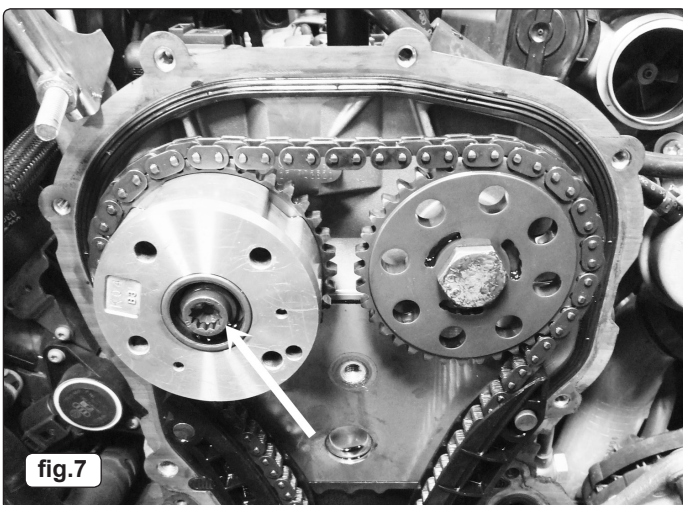
3.2.4. Position the engine at TDC No.1 cylinder using VS1404 TDC Tool and DTI, ensuring the piston is at the top of its compression stroke, as described earlier in "Checking valve timing".



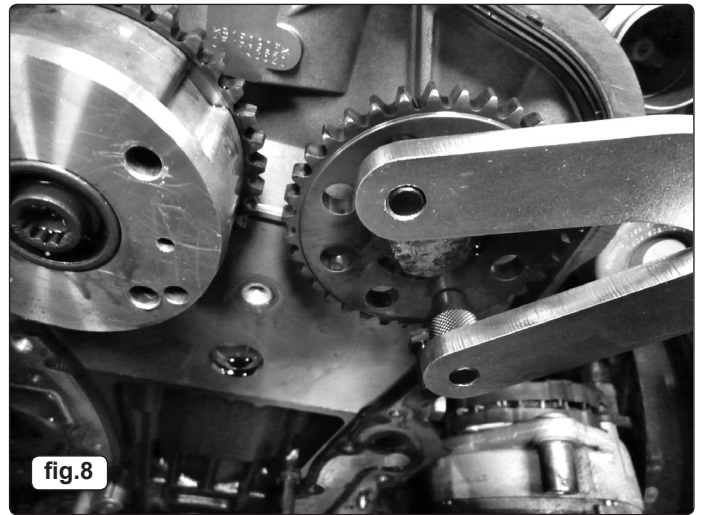
3.2.5. Turn the crankshaft against the direction of engine rotation, by 45°. Push the chain guide rail against the chain tensioner piston. Insert VS4593-1E Tensioner Locking Pin to 'lock' the piston in position (fig.6). **IMPORTANT:** Mark the timing chain with the direction of rotation.



WARNING: On engines fitted with VVT, the Camshaft Timing Adjuster bolt (inlet camshaft sprocket) has a **LEFT-HAND THREAD** (fig.7).



3.2.6. Remove the camshaft sprockets/VVT unit, timing chain and bolts, using a Sprocket Holding Tool (not in set), as a counter-hold whilst releasing the sprocket bolts (fig.8). Refit the sprockets/VVT unit with new bolts, **DO NOT** refit the chain at this stage. Tighten standard camshaft sprocket bolts to 50Nm, and VVT unit bolts to 40Nm.



3.2.7. Turn the camshafts until the VS4846 Setting Plate can be inserted into the recesses and the two holes in the rear of the camshafts (fig.9). **NOTE:** "TOP" marked on the centre bridge of the Plate, must be at the top.

3.2.8. Counter-hold the sprockets using a Sprocket Holding Tool (fig.8), and slacken the camshaft sprocket/VVT unit bolts. **DO NOT** use VS4846 Setting Plate as a counter-hold tool.

3.2.9. Remove one of the camshaft sprockets, install the timing chain and refit the camshaft sprocket.

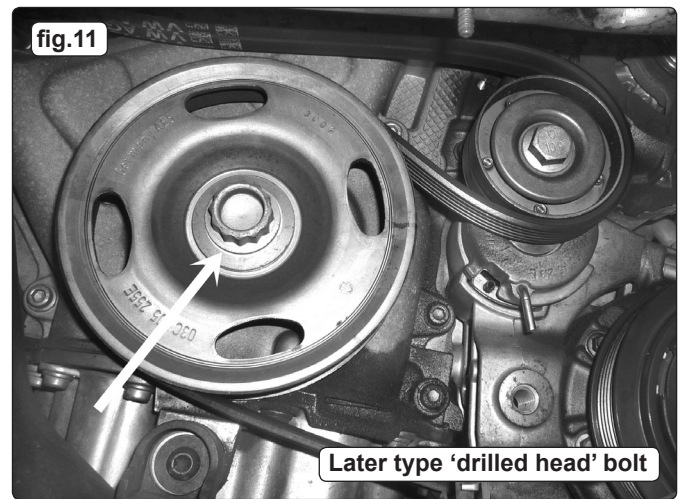
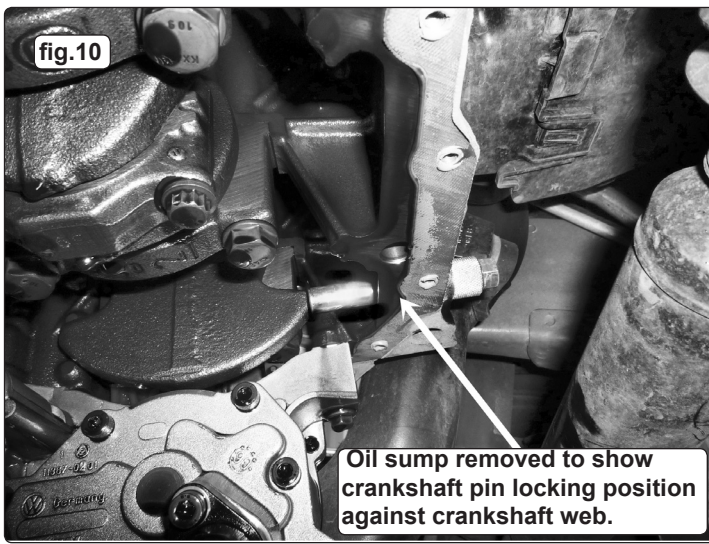
3.2.10. Tighten sprocket bolts finger-tight only, so that the camshaft sprockets/VVT unit can still turn freely on the camshafts.

3.2.11. Apply tension to the timing chain by removing the VS4593-1E Pin from the tensioner.

3.2.12. Turn the crankshaft in the normal direction of engine rotation and using VS1404 TDC Tool and DTI, establish TDC at No.1 cylinder.



WARNING: Whilst establishing TDC on these engines, the crankshaft **MUST NOT** be turned or be allowed to move more than 0.01mm past the TDC position. If this occurs, turn the crankshaft backwards (against direction of rotation), approx. 45°, and then forward again to TDC No.1 cylinder position.



3.2.13. VS4851 Crankshaft Locking Pin (1.4 TFSi engines only)

On 1.4 TFSi engines, a Crankshaft Locking Pin is used when adjusting the timing. This pin sets the crankshaft at TDC position by contacting a machined face on one of the crankshaft webs with the end of the VS4851 Pin. Fit VS4851 Crankshaft Locking Pin and tighten to 30Nm.

3.2.14. Using a Sprocket Holding Tool to counter-hold the sprockets, tighten standard camshaft sprocket bolts to 50Nm, and VVT unit bolts to 40Nm.

WARNING: When tightening bolts, the crankshaft **MUST NOT** be allowed to turn and the timing chain should remain tensioned on both sides.

3.2.15. On 1.4 TFSi engines - Remove VS4851 Crankshaft Locking Pin.

3.2.16. Remove VS4846 Camshaft Setting Plate.

3.2.17. Turn the crankshaft two full rotations in the normal direction of engine rotation, returning to TDC position No.1 cylinder using VS1404 TDC Tool and DTI.

3.2.18. Refit VS4846 Setting Plate to check camshaft position. If this is not possible, repeat the "Timing Adjustment" procedure.

3.2.19. On 1.4 TFSi engines - Refit VS4851 Crankshaft Locking Pin and tighten in place to 30Nm.

3.2.20. Remove the VS4846 Camshaft Setting Plate.

3.2.21. Counter-hold the camshaft sprockets using a Sprocket Holding Tool, and tighten both sprocket bolts a **further 90°** ensuring that the sprockets do not turn on the camshafts.
NOTE: When installing the rear camshaft cover, new seals will be required.

3.3. Refitting the crankshaft pulley/timing chain cover. **IMPORTANT:** A **NEW** crank pulley bolt **MUST** be fitted.

Note: Two variants of the crankshaft pulley bolt have been used on these engines. The early type is identified by having a solid bolt head, while the later bolt has a drilling in the bolt head (fig.11).

The early type (solid head) should be tightened to a torque of 90Nm plus 90°

The later type (drilled head) should be tightened to a torque of 150Nm plus 180°.

3.3.1. Check that the crankshaft is positioned at TDC on No.1 cylinder using VS1404 TDC Tool and DTI.

3.3.2. On 1.4 TFSi engines - fit the VS4851 Crankshaft Locking Pin and tighten in place to 30Nm.

WARNING: On the rear face of the crankshaft gear is a raised lug. This lug locates in a recess in the crankshaft, setting the position and providing a positive connection between gear and crankshaft. Care must be taken when refitting the crankshaft pulley centre bolt to ensure that the lug on the crankshaft gear is located into the recess in the crankshaft. Failure to do so could result in damage to the engine.

3.3.3. Using a Crankshaft Pulley Holding Tool as a counter-hold, remove the old crankshaft bolt and pulley, then refit the timing chain cover.

3.3.4. Refit the crankshaft pulley using a new bolt and tighten finger-tight (ensuring correct crankshaft gear location).

3.3.5. Re-check camshaft position using VS4846 Setting Plate and the crankshaft position using VS1404 TDC Tool and DTI.

3.3.6. Remove VS4846 Camshaft Setting Plate.

3.3.7. Using a Crankshaft Pulley Holding Tool as a counter-hold, tighten the crankshaft bolt to the specified torque setting (see Note in 3.3.).

3.3.8. On 1.4 TFSi engines - Remove VS4851 Crankshaft Locking Pin.

3.3.9. A final stage timing check **MUST** be carried out to check that the valve timing is correct. Turn the crankshaft two full rotations in the normal direction of engine rotation, returning to TDC No.1 cylinder, using VS1404 TDC Tool and DTI.

3.3.10. Check the camshaft position by fitting VS4846 Camshaft Setting Plate.

3.3.11. Remove all tools and re-assemble the vehicle.

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IMPORTANT: No liability is accepted for incorrect use of this equipment.

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

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