

DIESEL ENGINE SETTING/LOCKING TOOL KIT

1. INTRODUCTION & APPLICATIONS

1.1. INTRODUCTION

VS1245 Setting/Locking Tool Kit covers engine timing/belt replacement on the range of **PUMPE DÜSE** diesel engines fitted in VW Group - Audi, Seat and Volkswagen - models and in Ford Galaxy from 1999.

The kit contains the required Crank Locking Tool, Camshaft Pin and Tensioner Tools to suit 1.2TDi, 1.4TDi and 1.9TDi engine variants.

1.2. APPLICATIONS - PUMPE DÜSE engines

Audi: A2, A3, A4 & A6

Seat: Arosa & Alhambra

Ford: Galaxy (99-)

Volkswagen: Lupo, Polo, Golf, Bora, Passat, New Beetle & Sharan

Engine Types - AJM, AMF, ANU, ANY, ASZ, ATD, ATJ, AUY, AVB, AVF, AWX, AXR, AYZ.

Note: Also for Petrol Engine Applications - Audi A4 1.8 Turbo/2.0 (01-) AVJ engines.

2. SAFETY INSTRUCTIONS

WARNING! Ensure that 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 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.

3. CONTENTS & ASSOCIATED TOOLS

3.1. Contents

1. VS1245/01 Crankshaft Locking Tool
2. VS1245/02 Tensioner Adjuster
3. VS1245/03 Tensioner Locking Tool
4. VS1245/04 Tensioner Setting Tool
5. VS124/V2 Camshaft Locking Pin
6. VS1245/V3 Auxiliary Belt Tensioner Locking Pin
- VS1245/84 Case + Insert

3.2. Associated Tools & Applications:

Use with:

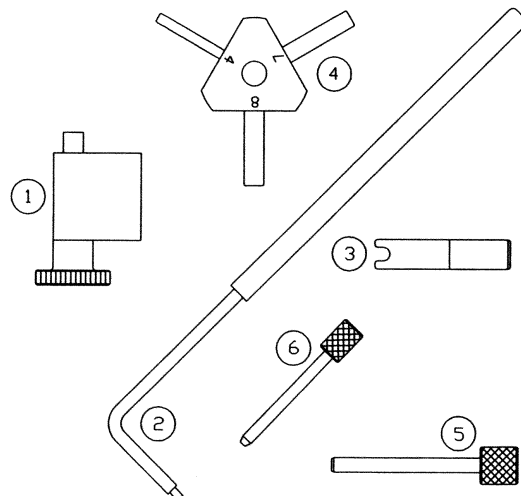
Front Panel Support Guides (Pair) - Audi A4/A6 & VW Passat VS124/02

Associated Tools:

Petrol and Diesel (non Pumpe Düse) Engine Setting/Locking Tool KitVS124

V6 2.5TDi Diesel Engine Setting/Locking Tool KitVS1240

Twin Cam Camshaft Setting Tool - 1.4 & 1.6 (97-)VS1246



4. INSTRUCTIONS

4.1. General Guidelines

Timing belt replacement on this range of PUMPE DÜSE TDi engines requires the crankshaft and camshaft to be locked in the timing position, the tensioner unit to be restrained and the tensioner position to be adjusted. VS1245 Kit contains all the setting and locking tools required to cover this application.

Preparation of the engine, and removal of obstructing components, for belt replacement varies according to model/engine but generally turbocharger and intercooler hoses will need to be removed along with timing covers and the crankshaft pulley. It will be necessary to correctly support the engine as mounting brackets will require removal.

WARNING! On some models the fuel lines will need to be detached from the engine cover. The fuel is pressurised and can be **VERY HOT**. Take great care to contain any escaping fuel spray and avoid spillage when detaching lines.

On models with AJM, ASZ, ATD, AUY engines the right-hand headlight will need to be removed.

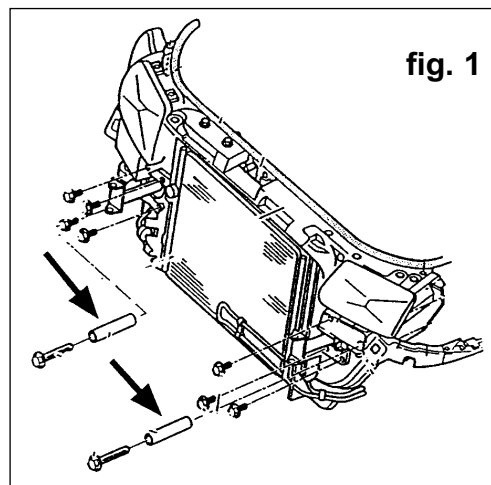
On VW Passat and Audi A4/A6 models the radiator support panel must be moved forward.

Use VS124/02 Front Panel Support Guides (pair) - associated tool, not in kit - to allow the front panel to be moved to the service position - fig. 1.

IMPORTANT! The engine must be **COLD** when carrying out timing belt replacement.

4.2. VS1245/V3 Auxiliary Belt Tensioner Locking Pin

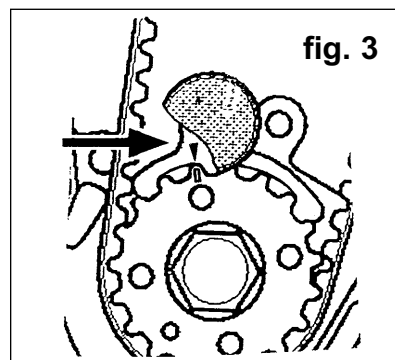
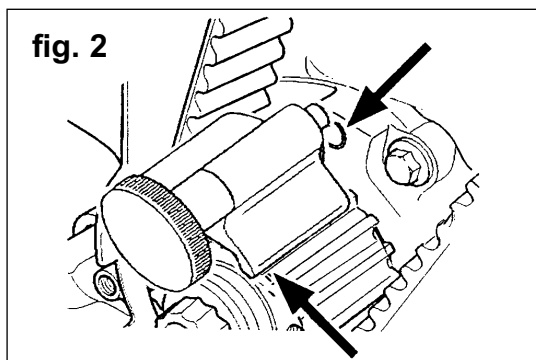
1. Lock down the tensioner of the auxiliary drive belt using VS1245/V3 Locking Pin.
2. Remove the tensioner unit, allowing access to the front of the engine.



4.3. VS1245/01 Crankshaft Locking Tool

1. Turn the crankshaft clockwise to the TDC position, ensuring that the timing marks align.
2. Lock the crankshaft gear in this position using VS1245/01 Locking Tool. The tool locates into the gear teeth and into the hole in the oil seal housing - fig. 2.

IMPORTANT! The timing mark "arrow" on VS1245/01 Crank Locking Tool must align with the mark on the crank gear - fig. 3.



4.4. VS124/V2 Camshaft Locking Pin

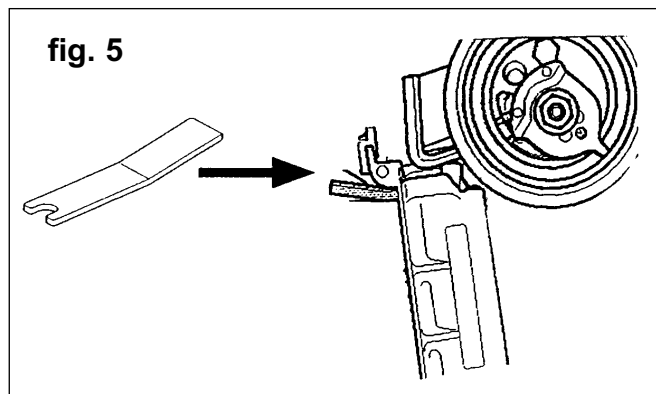
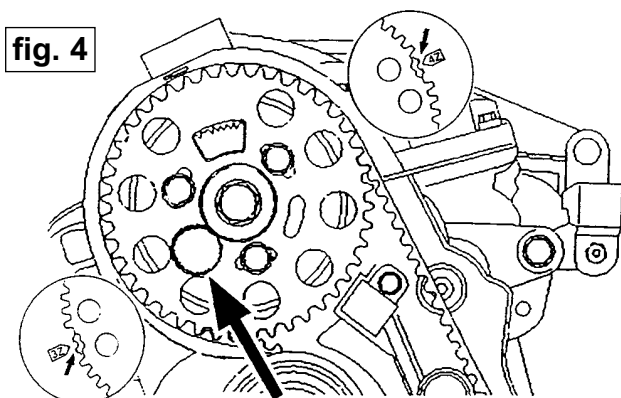
1. Check that the timing marks align for the camshaft. The notch on the camshaft sprocket (located behind the sprocket teeth), should align with the mark on the casting - "3Z" (on left) for ANY and AMF engines, or "4Z" (on right) for the other engines listed under Applications - fig. 4.
2. Lock the camshaft in position by inserting VS124/V2 Locking Pin through the free elongated hole on the left side of the sprocket and into the datum hole in the cylinder head.

4.5. VS1245/03 Tensioner Locking Tool

1. Using an allen key, turn the tensioner anti-clockwise until VS1245/03 Tensioner Locking Tool can be inserted - fig. 5.
IMPORTANT! Ensure that the allen key is inserted fully into the hexagon as this is quite shallow and could be rounded off if the allen key slips out.
2. Remove the tensioner device and timing belt.
3. Check that the Crank Locking Tool, Camshaft Locking Pin and Tensioner Locking Tool are all in place and that all timing marks align.
4. Loosen the camshaft sprocket bolts and turn the sprocket fully clockwise so that the bolts are at the ends of the elongated holes. Tighten bolts finger-tight only.

4.6. VS1245/02 Tensioner Adjuster

1. Locate VS1245/02 Adjuster into the two holes in the tensioner eccentric and turn it clockwise until pointer 1 comes to a stop at position 2 - fig. 6.



2. Fit the new timing belt in the following order - camshaft sprocket, tensioner, crankshaft gear, water pump sprocket.
Note: For timing belt replacement - engine must be **COLD**.
3. Install the tensioner device.
IMPORTANT! The belt must also be taut between the sprockets on the side opposite the tensioner.
4. Turn the tensioner eccentric anti-clockwise, using VS1245/02 Adjuster, back towards position 3 until the VS1245/03 Tensioner Locking Tool can be easily removed - fig. 6.

4.7. VS1245/04 Tensioner Setting Tool

The VS1245/04 Setting Tool provides 4, 7 and 8mm pins for setting the gap on the tensioner at position A (fig. 6), as follows -
Engines ANY and AYZ - 7mm \pm 1mm.

Engines listed in Applications (except ANY, AYZ and AVJ) - 4mm. \pm 1mm

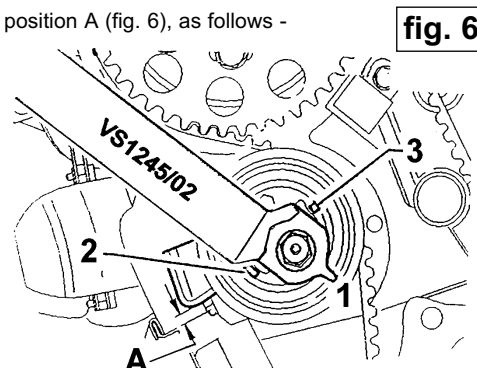
Note: Audi petrol engine application - A4 1.8 Turbo/2.0 (01-) AVJ uses the same tensioner setting procedure utilising:

VS1245/02 Adjuster, VS1245/03 Tensioner Locking Tool and VS1245/04 Setting Tool with a gap setting of 8mm \pm 1mm.

1. Insert the appropriate size pin from VS1245/04 at position A and using VS1245/02 Adjuster carefully turn the tensioner clockwise to adjust the distance at position A to the pin diameter. Tighten tensioner nut - fig. 6.
2. Tighten camshaft sprocket bolts and remove locking tools from crankshaft and camshaft.
3. Turn the engine over twice, by hand, and return the crankshaft to TDC position.
4. Check that the tensioner dimension at position A is as specified above.

4.8. Final Checking Procedure

1. Lock the crankshaft with Tool VS1245/01, engaging the crank gear teeth and with the lug in the hole in oil seal housing - fig. 2.
2. Ensure that the timing mark on the tool aligns with the engine timing mark - fig. 3.
IMPORTANT! The VS1245/01 Locking Tool **MUST NOT** be in position whilst the engine is being rotated. The engine must be positioned



at TDC **BEFORE** the tool is fitted. If the engine is turned passed the TDC position, turn the crankshaft back $\frac{1}{4}$ turn and then forward again to insert the tool.

3. Once VS1245/01 is fitted, check that the tensioner dimension at position A - fig. 6 - is to specification, and that VS124/V2 Locking Pin can be inserted through the camshaft sprocket into the datum hole in the engine - fig. 4.
- 3.1. If the tensioner dimension is not within tolerance, hold the tensioner eccentric with VS1245/02 Adjuster, loosen the tensioner nut to allow the tensioner to be moved under control, and adjust.
Remove all tools, turn engine over twice and repeat the final checking procedure.
- 3.2. If the Camshaft Locking Pin cannot be inserted, pull the Crank Locking Tool out of the hole in oil seal housing and turn the crankshaft until the Camshaft Locking Pin can be fully inserted through the sprocket. Loosen the camshaft sprocket bolts and turn the crankshaft slightly against the normal direction of rotation until the Crank Locking Tool passes the hole in the oil seal housing. Then turn the crankshaft back in the normal direction to engage the locking tool lug in the hole.
Tighten the camshaft sprocket bolts.
Remove all tools, turn engine over twice and repeat the final checking procedure.



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