VS1403

PETROL ENGINE TWIN CAM SETTING/LOCKING TOOL KIT FOR FIAT 1.8 16v.

1. INTRODUCTION & APPLICATION

1.1. Introduction

VS1403 Kit covers both variants of the 1.8 16v. engines, including those with VVT.
The kit incorporates Camshaft Setting Plates, which are fixed in place of the camshaft bearing caps to accurately position the twin camshafts in their timed position, and also includes Crankshaft Locking Tool and Tensioner Adjuster.

Note: TDC position on Fiat Twin Cam engines is established using VS1404 TDC Positioning Tool - an associated tool, not included in kit. VS1404 requires a suitable Dial Test Indicator, such as AK9634M.

1.2. Applications

Fiat 1.8 16v. Twin Cam engines in Barchetta (95-), Brava/Bravo (95-), Coupe (96-), Marea/Marea Weekend (96-).

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.

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

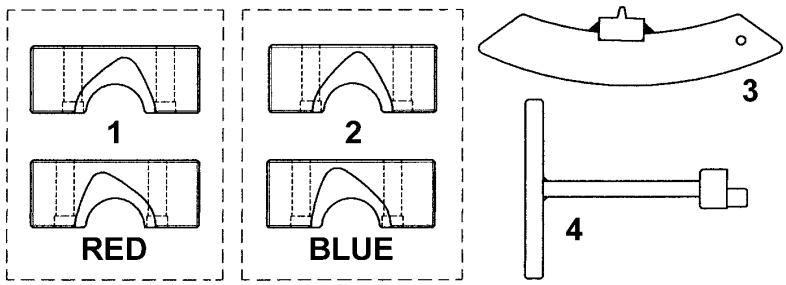
3.1. Contents

1. VS1403/01 Camshaft Setting Plate Set (Red)
2. VS1403/02 Camshaft Setting Plate Set (Blue)
3. VS1403/03 Crank Locking Tool
4. VS1403/04 Tensioner Adjuster

-- VS1403/84 Case + Insert

3.2. Associated Essential Tool

TDC Positioning Tool (use with AK9634M DTI) VS1404



4. INSTRUCTIONS

General Guide - Setting & Locking FIAT TWIN CAM engines
Timing belt replacement on 1.6/1.8 16v. and 2.0 20v. Fiat twin camshaft engines is carried out with the crankshaft at TDC, established by using VS1404 TDC Position Tool to determine the piston position in No.1 cylinder, and then by checking that all timing marks align.
Note: To avoid kit contents duplication, VS1404 TDC Position Tool is not included in individual kits but is available as an Associated Tool. It is used on all Fiat 1.6, 1.8 and 2.0 multi-valve engines.
On 1.8 16v. engines the camshafts are retained by use of Setting Plates fixed in place of designated bearing caps.
Once crank and camshaft timing positions are 'locked', the tensioner is slackened and the old belt removed. Both the camshaft sprockets are released and free to turn on the camshafts.
Marks on the new belt are aligned to marks on the sprockets/pulley and fitted in the order given for each engine. Initially the timing belt tension is adjusted to maximum, using the appropriate Tensioner Adjuster.
The camshaft sprocket bolts are then tightened, and all setting/locking tools removed and bearing caps re-fitted.
The engine is rotated by hand and VS1404 TDC Position Tool refitted to ensure return to TDC.
The tensioner is adjusted to operating position and the engine rotated again and returned to TDC. All timing marks must align. It is good practice to confirm the timing is correct by adjusting to TDC and refitting crank and camshaft tools to check the timing position.
Important! DO NOT use Camshaft Setting Plates to hold camshafts in position whilst releasing or tightening the sprocket bolts. Plates are for retention of timing position only. Use Sprocket Holding Tool VS169 (fig. 6) to counter-hold sprockets, taking care not to damage any position sensors located behind the sprockets. VS169 is an associated tool, not included in kit.

4.1. VS1403/01 Camshaft Setting Plate Set (RED) & VS1403/02 Camshaft Setting Plate Set (BLUE)

IMPORTANT: There are two variants of the 1.8 16v. twin cam petrol engine. One uses VS1403/01 and the other VS1403/02. Both Plate Sets are included in this kit. Ensure that you are using the correct set for the engine being worked on - see 4.2. Camshaft Setting Plates/Locations - 1.8 16v. engines.

On 1.8 16v. twin cam engines the camshafts are retained in their 'timed' positions by Cam Setting Plates which are bolted in position in place of designated bearing caps on both the inlet and exhaust camshafts (fig.1).
Each Setting Plate is machined to provide the exact profile and 'timed' position of the cam at the designated bearing location.
Important! Care **MUST BE** taken when fitting Cam Setting Plates to ensure that (1) the correct set of plates is being used for the engine being worked on - plates are part numbered and colour coded, (2) the correct plate is used on the inlet camshaft and exhaust camshaft - plates are clearly marked "Inlet" and "Exh", (3) each plate is fitted in place of the bearing cap of the designated cylinder only - plates are marked eg. "2 Cyl", and (4) fixing holes in the plates match the off-set bearing cap holes and plates exactly match the cam lobe profile.

When removing camshaft bearing caps, clearly mark which is the inlet and exhaust and keep clean at all times. When installing Cam Setting Plates and subsequently re-fitting bearing caps, always tighten bolts to specified torque.

1.8 16v. new belt is fitted in the following order - Crank, Guide, Cam (Exh), Cam (Inlet), Tensioner, Water Pump.

4.2. Camshaft Setting Plates/Locations - 1.8 16v. engines

VS1403/01 (RED)	Brava/Bravo, Marea/Weekend	Engine 182 A2.000	Inlet: Bearing Cap of No.2 cyl. Exhaust: Bearing Cap of No.3 cyl.
VS1403/02 (BLUE)	Barchetta, Coupe	Engine 183 A1.000	Inlet: Bearing Cap of No.2 cyl. Exhaust: Bearing Cap of No.3 cyl.

4.3. VS1403/03 Crankshaft Locking Tool

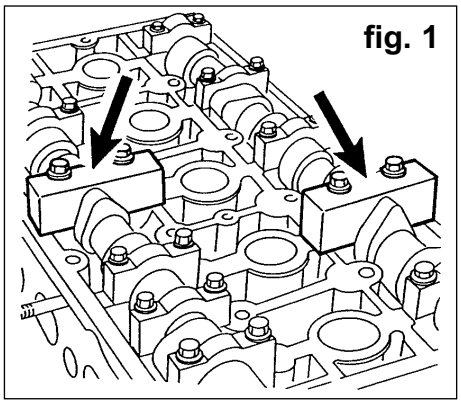
VS1403/03 is used to 'lock' the flywheel to retain the crankshaft at TDC and as a counter-holding device to release/tighten the crank pulley bolt when removing and installing the pulley (fig. 2).
Once TDC is established by using VS1404 TDC Position Tool (fig. 3), the VS1403/03 Locking Tool is fitted to remove the crank pulley. The crank gear/flywheel timing marks are checked and if necessary, VS1403/03 temporarily removed, to adjust and align marks. VS1403/03 is then refitted to 'lock' the crank in position. With the crank and camshafts held in their 'timed' position the camshaft sprockets can be released, new belt fitted and initial tension applied. The VS1403/03 is removed prior to the engine being rotated twice and returned to TDC and for the final tensioning procedure.

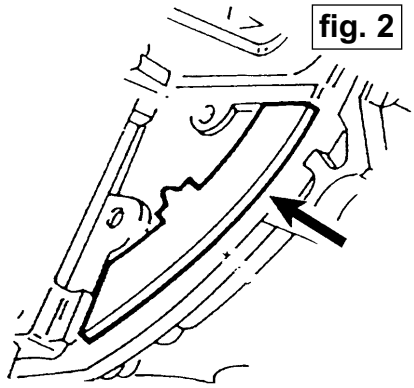
4.4. VS1403/04 Tensioner Adjuster

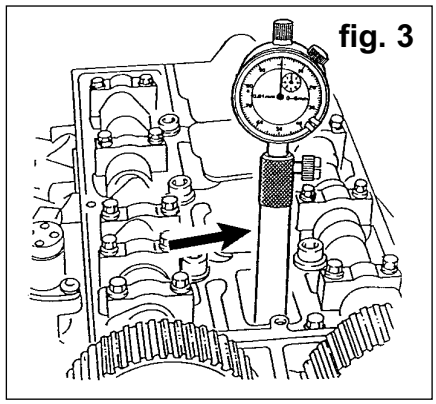
This 'T-Handle' Adjuster (fig. 4) is inserted through an opening in the tensioner support and, after fitting the new belt, turned to initially adjust to the maximum tension position.
After tightening the camshaft sprocket bolts, rotating engine twice, by hand, and ensuring timing marks align at TDC, adjust tensioner to final position using VS1403/04 so that the pointer aligns with the reference on the crankcase - see fig. 5.

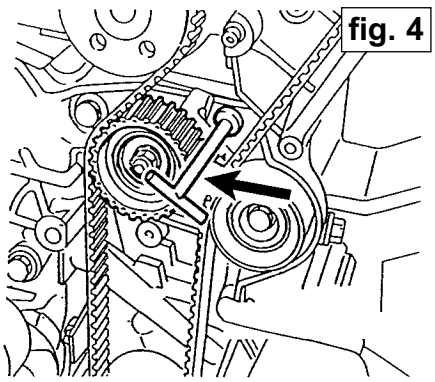
4.5. VS1404 TDC Position Tool (associated tool - not in kit)

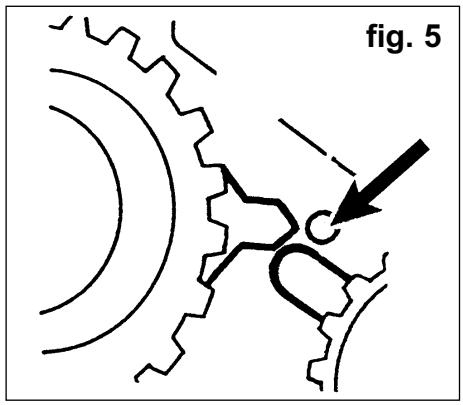
The correct engine/crank TDC position is established using VS1404 Tool together with a suitable DTI, such as AK9634M Dial Gauge. VS1404 Tool determines when the piston of No.1 cylinder is at its highest point. **Note: This must be when it is on its ignition stroke.**
Remove the spark plugs. Install the DTI into VS1404 and secure with the thumbscrew.
Screw VS1404 fully into the spark plug hole of No.1 cylinder, taking care not to overtighten. By turning the crankshaft, in the normal direction of engine rotation, the piston will raise the indicator pin of VS1404 and in turn move the needle of the DTI.
TDC is achieved when the DTI needle reaches its highest reading and starts to move in the reverse direction.
Check that all timing marks align.

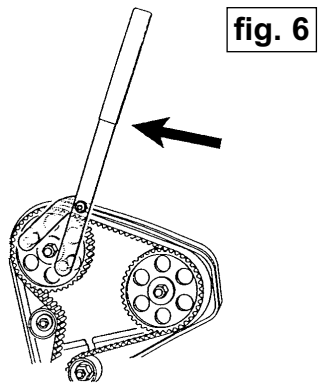












NOTE: *It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.*

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.
INFORMATION: For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.

SEALEY Professional TOOLS AUTO SERVICE LINE

Sole U.K. Distributor, Sealey Group,
Bury St. Edmunds, Suffolk.

01284 757500 *01284 703534* ***E-mail:*** *sales@sealey.co.uk*