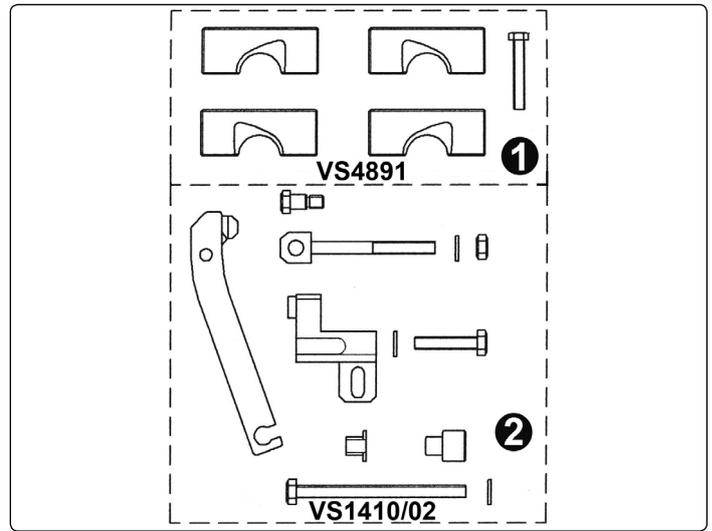


Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.

**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. INTRODUCTION & CONTENTS

Essential tools for setting and locking Alfa Romeo 3.2 V6 petrol engines. Kit contains camshaft setting plates to accurately position the four camshafts in their timed positions. The kit also includes a tensioner tool for adjusting the timing belt. Supplied with warning tag. Note that the TDC position is determined by using VSE2515 tool in conjunction with AK9634M dial gauge indicator.



Contents			OEM Number
Item	Part Number	Description	Alfa Romeo
1.	VS4891	Camshaft Setting Plates	1.870.849.000
2.	VS1410/02	Timing Belt Tensioning Tool	1.860.950.000/1.821.225.000
<b>Associated Tools</b>			
---	AK9634M/VSE2515	Dial Gauge & Adapter	1.825.013.000

This information table provides the Vehicle Manufacturer's Specialised Tool references and the Sealey tool numbers covering the relevant service application.

## 2. APPLICATIONS

### Vehicle Applications:

Make:	Model:	Year:	Engine Codes:
Alfa Romeo:	147 GTA	(02-08)	932A.000
	156 GTA	(02-05)	936A.000
	166	(03-08)	936A6.000
	Spider	(03-06)	
	GTV	(03-06)	
	GT	(04-09)	

### Engine Codes:

## 3. 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 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.

## 4. INSTRUCTIONS

### VS4890 V6 Petrol Engine Setting/Locking Tool Kit

Comprises: VS4891 Camshaft Setting Plate Set (4 x Plates - Light Blue)  
VS1410/02 Tensioner Tool

#### 4.1 Engine Setting & Locking - 3.2 V6 (general)

In order to remove the timing belt on 3.2 V6 engines it is necessary to first remove the crankshaft pulley. A suitable pulley holding tool is required to counter-hold the pulley whilst releasing the pulley nut. It is also used when refitting the pulley.

**WARNING: High torque loading on pulley nut.**

Timing belt replacement is carried out with the crankshaft at TDC, established by using **VSE2515** TDC Position Tool to determine the piston position of No.1 cylinder.

Once TDC is established a **visual check** is required to confirm that correct camshaft timing position has been achieved. The reference marks on the rear of the camshafts should face towards the centre of each cylinder head and be in line with the cylinder head upper surface.

Each camshaft is retained in its 'timed' position by use of Special Camshaft Setting Plates - **VS4891** (set of 4), fixed in place of designated bearing caps.

Once the crankshaft and camshafts are 'set' in their 'timed' positions the belt tensioner securing bolts can be loosened and the timing belt removed.

All four camshaft sprockets must be released and free to turn on the camshafts whilst the new belt is fitted in an **anti-clockwise** direction starting at the crankshaft gear.

**VS1410/02** Tensioner Tool is fitted and the tensioner adjusted to align its marks. The camshaft sprocket bolts are then tightened.

**WARNING: The Camshaft Setting Plates must NOT be used to counter-hold the crank or camshafts for removing/releasing pulleys or sprockets. They are for retention of engine timing position only. Use appropriate Holding Tool.**

#### 4.2 VSE2515 TDC Positioning Tool (associated tool - not in kit)

The correct engine/crank TDC position is established using **VSE2515** Tool together with a suitable Dial Test Indicator, such as **AK9634M** Dial Gauge (**Fig.1**).

**VSE2515** Tool determines when the piston of No.1 cylinder is at its highest point,

**NOTE:** must be when it is at the top of its compression/ignition stroke.

Remove the spark plugs and install **AK9634M** Dial Gauge into **VSE2515** and secure with the Thumbscrew.

Screw **VSE2515** fully into the centre 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 **VSE2515** and in turn move the needle of the dial gauge. TDC is achieved when the dial gauge needle reaches its highest reading and starts to move in the reverse direction.

Confirm TDC by rotating the crankshaft in both directions, using small movements, **IMPORTANT:** Ensure that the final crankshaft rotation is in the direction of engine rotation. Check that all timing marks align.

#### 4.3 VS4891 Camshaft Setting Plate Set (LIGHT BLUE)

On this Alfa Romeo 3.2 V6 Quad Cam engine the four camshafts are retained in their 'timed' positions by Camshaft Setting Plates which are bolted in place of designated bearing caps on both inlet and both exhaust camshafts.

Each Setting Plate is machined to provide the exact profile and 'timed' position of the cam at the designated bearing location (**Fig.2 and Fig.3**).

#### Associated Tool - VSE2515



Fig.1

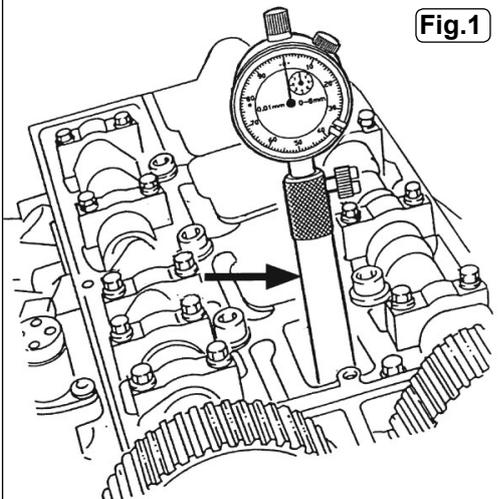
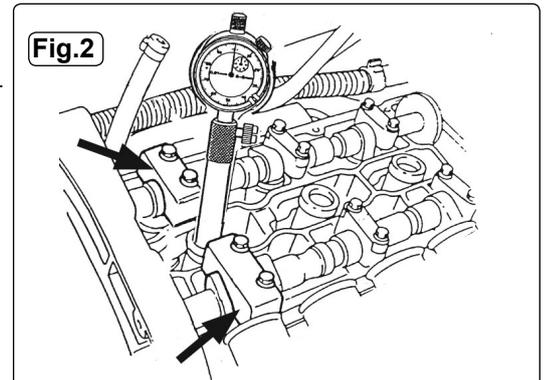


Fig.2



Left-hand cylinder head  
Camshaft Setting Plates location  
(viewed from camshaft sprockets)

**IMPORTANT:** Care **MUST BE** taken when fitting Camshaft Setting Plates to ensure:

- (1) The correct set of plates are being used for the engine being worked on, plates are part numbered and colour coded.
- (2) The correct plates are used on the Inlet camshafts and Exhaust camshafts, plates are clearly marked "Inlet" or "Exh".
- (3) Each plate is fitted in place of the bearing cap of the designated cylinder only, plates are marked eg. "6 Cyl".
- (4) The cam lobe profile exactly matches the Cam Plate profile and when fitting the Plates, ensure the "arrows" on top of each Plate point towards the camshaft sprockets.

Camshaft Setting Plates/Locations

**VS4891** Camshaft Setting Plate Set

LEFT-HAND Cylinder Head WHEN VIEWED FROM CAMSHAFT SPROCKETS  
(Bearing Caps "B" & "G")

Inlet: Bearing Cap of No.1 cyl. (**VS4891-1**)

Exhaust: Bearing Cap of No.1 cyl. (**VS4891-2**)

RIGHT-HAND Cylinder Head WHEN VIEWED FROM CAMSHAFT SPROCKETS  
(Bearing Caps "4" & "7")

Inlet: Bearing Cap of No.6 cyl. (**VS4891-4**)

Exhaust: Bearing Cap of No.4 cyl. (**VS4891-3**)

When removing camshaft bearing caps, clearly mark which is Left-hand and Right-hand, inlet and exhaust and keep clean at all times.

**IMPORTANT:** When installing the Camshaft Setting Plates **USE ONLY** the Special Retaining Bolts supplied in the kit.

When subsequently re-fitting bearing caps using original bolts, always tighten to specified torque, 18-20Nm.

To remove the timing belt the securing bolts of the tensioner assembly are loosened and the tensioner allowed to move away from the belt.

Slacken the bolts of each camshaft sprocket and ensure sprockets are free to turn without tilting.

**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 to counter-hold sprockets, taking care not to damage any position sensors located behind the sprockets.

**4.4 VS1410/02 Timing Belt Tensioner Tool**

The **VS1410/02** Tensioner Tool is attached to the engine and via a 'pivot action' applies leverage to the plate of the tensioner assembly which it turn reacts on the eccentric of the tensioner roller and applies tension to the timing belt (**Fig.4**).

Once the new timing belt has been installed, **VS1410/02** Tensioner Tool is assembled and fitted to the engine using parts shown in **Fig.5**, as follows:

Adjusting Body (1) is attached to the water pump using Bolt (8) and Washer (9).

Adjusting Arm (4) is attached to the alternator with Bolt (7) and Washer (10).

**NOTE:** Spacer (5) or (6) is located into the lower pivot hole of the Adjusting Arm prior to inserting the securing bolt. Spacer (6) is rotated to close slot in Arm to prevent detachment from securing bolt during application.

The Adjusting Body (1) and Arm (4) are connected by fitting Tension Bar (2) between them, using Bolt (3) Washer (10) and Nut (11).

The right-angle section at the top of the Adjusting Arm is placed against the tensioner assembly and reacts on, and moves, the plate as the Nut of the Tension Bar is tightened.

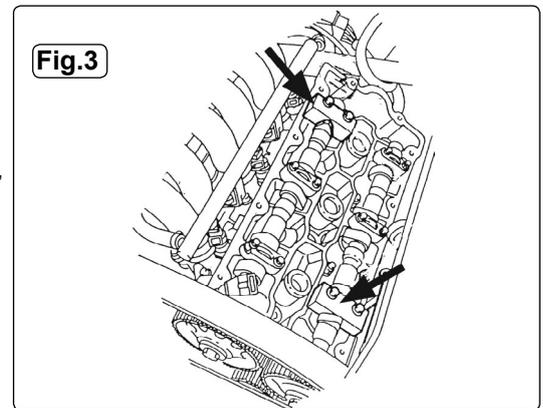
As the plate moves it applies tension to the belt and correct tension is achieved when the moveable index mark of the tensioner aligns (is directly behind) the fixed notch on the Front Plate of the tensioner.

Once correct tension is achieved, tighten the tensioner securing bolts and then tighten the camshaft sprocket bolts.

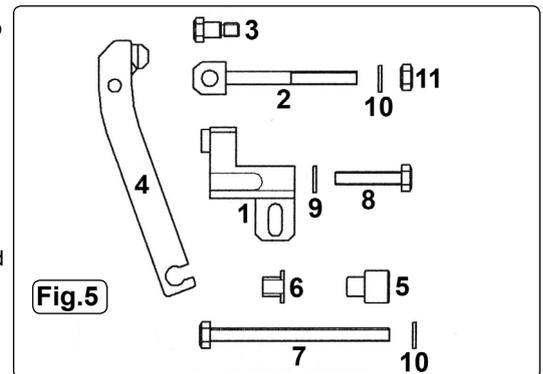
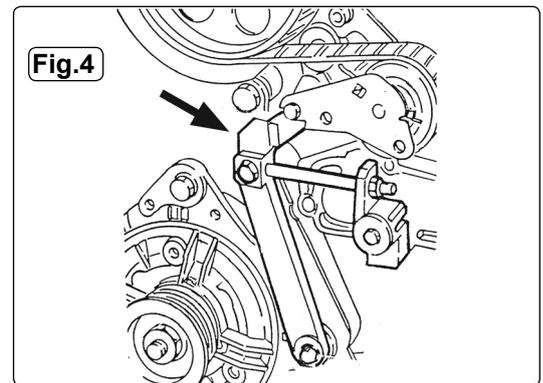
Remove TDC Tool and Camshaft Plates and re-fit the bearing caps.

Carefully turn the engine over twice, in the normal direction of rotation, and check that the tensioner marks are still correctly aligned.

If necessary, re-align them by adjusting via the Tensioner Tool.



Right-hand cylinder head  
Camshaft Setting Plates location  
(viewed from camshaft sprockets)



**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 this product.

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

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