

Instructions for:
Al-Fi Camshaft Setting Plate Kits
Alfa Romeo and Fiat twin camshaft
petrol engines
Model Nos: VS4900, VS4905, VS4906,
VS4907, VS4908

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 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.

2. INTRODUCTION & APPLICATIONS

2.1 Introduction

Engine timing and timing belt replacement applications on the Alfa Romeo Twinspark/JTS range and Fiat 16v/20v engines, require the camshafts to be retained in their 'timed' positions by use of **Camshaft Setting Plates which are fixed on the engine, in place of designated bearing caps, at specified cylinder locations.**

These specialised tools for setting camshaft timing position on Alfa Romeo and Fiat engines are based on a unique multi-position, interchangeable plates system. Kits comprise camshaft plates, support blocks, extra-long mounting bolts and positioning pins. The kits provide full coverage of a range of engines, replacing the need for engine specific camshaft plates. As Support Blocks are universal, and are included in all initial kits, applications can be subsequently expanded, simply by adding further Setting Plate Sets to cover a greater range of models and engines. Supplied with warning tag.

2.2 Applications

Models:

ALFA ROMEO: 145, 146, 147, 155, 156, 166, GT, GTV, Spider
 FIAT: Barchetta, Brava, Bravo, Coupe, Marea, Marea Weekend, Punto, Stilo

Engines:

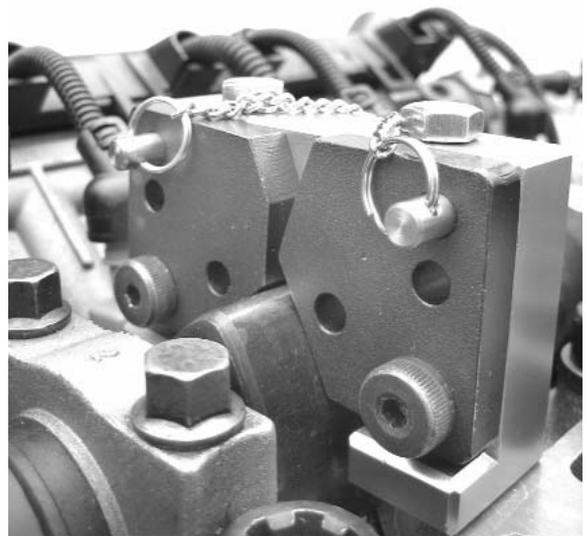
ALFA ROMEO: 1.4, 1.6, 1.8 and 2.0 Twinspark and 2.0 JTS petrol.
 FIAT: 1.8 16v and 2.0/2.4 20v Twin Camshaft petrol.

Refer to the Data Chart provided in the kit for specific model / engine code information, setting plate selection and cylinder fixing locations.

Al-Fi Kit Range:

VS4900	ALFA ROMEO & FIAT	Complete Kit (all applications detailed above)
VS4905	ALFA ROMEO	1.4, 1.6, 1.8, 2.0 Twinspark and 2.0 JTS
VS4906	FIAT	1.8 16v Twin Camshaft
VS4907	FIAT	2.0 and 2.4 20v Twin Camshaft
VS4908	FIAT	Combined - 1.8 16v and 2.0/2.4 20v Twin Camshaft

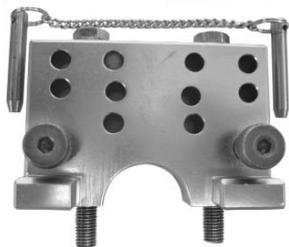
VS4900



PATENTS APPLIED

3. CONTENTS

3.1 Parts



VS4900/1
Support Block Assembly
(Inlet Camshafts)
c/w Retaining Bolts (2),
Securing Screws (2) and
Location Pin Assembly.



VS4900/2
Support Block Assembly
(Exhaust Camshafts)
c/w Retaining Bolts (2),
Securing Screws (2) and
Location Pin Assembly.



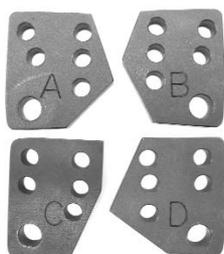
VS4900/3
Replacement Flanged
Retaining Bolt Set (4)
Note: 2 off each bolt
included with both VS4900/1
and VS4900/2 Support
Blocks



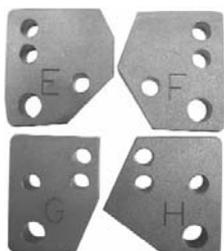
VS4900/4
Replacement Plate Securing
Screw Set (4)
Note: 2 off each screw
included with both VS4900/1
and VS4900/2 Support
Blocks



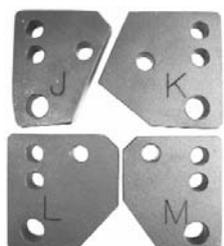
VS4900/5
Replacement Location
Pins/Chain Assembly
Note: 1 off Included with both
VS4900/1 and VS4900/2
Support Blocks



VS4901
Set of 4 Setting Plates
A and B - Inlet
C and D - Exhaust
Alfa Romeo Applications



VS4902
Set of 4 Setting Plates
E and F - Inlet
G and H - Exhaust
Fiat 1.8 16v Applications



VS4903
Set of 4 Setting Plates
J and K - Inlet
L and M - Exhaust
Fiat 2.0/2.4 20v Applications

3.2 Kit contents

VS4900

Complete Alfa Romeo & Fiat Camshaft Setting Plate Kit

Comprises: **VS4900/1** Support Block Assembly
VS4900/2 Support Block Assembly
VS4901 Camshaft Setting Plate Set (A,B,C,D)
VS4902 Camshaft Setting Plate Set (E,F,G,H)
VS4903 Camshaft Setting Plate Set (J,K,L,M)
VS4900/84 Case and Insert



VS4905

Alfa Romeo Camshaft Setting Plate Kit

Comprises: **VS4900/1** Support Block Assembly
VS4900/2 Support Block Assembly
VS4901 Camshaft Setting Plate Set (A,B,C,D)
VS4900/84 Case and Insert



VS4906

Fiat Camshaft Setting Plate Kit (1.8 16v)

Comprises: **VS4900/1** Support Block Assembly
VS4900/2 Support Block Assembly
VS4902 Camshaft Setting Plate Set (E,F,G,H)
VS4900/84 Case and Insert



VS4907

Fiat Camshaft Setting Plate Kit (2.0/2.4 20v)

Comprises: **VS4900/1** Support Block Assembly
VS4900/2 Support Block Assembly
VS4903 Camshaft Setting Plate Set (J,K,L,M)
VS4900/84 Case and Insert



VS4908

Combination Fiat Camshaft Setting Plate Kit

Comprises: **VS4900/1** Support Block Assembly
VS4900/2 Support Block Assembly
VS4902 Camshaft Setting Plate Set (E,F,G,H)
VS4903 Camshaft Setting Plate Set (J,K,L,M)
VS4900/84 Case and Insert



4. INSTRUCTIONS

4.1 The AI-Fi range of Universal Camshaft Setting Plates provides wide application coverage across engine ranges by utilising common **Support Blocks** - one for all Inlet camshafts, and one for all Exhaust camshafts. **Interchangeable Setting Plates** are mounted on to these Support Blocks.

The position of the Setting Plates on the Support Blocks is adjustable in order to provide coverage of a range of engines. The required **Setting Plate position** on the Support Block, is accurately achieved, and maintained, via the '**location pin**' which is inserted through a numbered location hole in the Support Block and through a hole in the Setting Plate. When mounted on the engine, this assembly fixes the position of the camshaft lobe to achieve correct camshaft timing position.

4.2 **Selecting the correct AI-Fi parts and assembling the Camshaft Setting Plate system for use.**

4.2.1 The Inlet Camshaft Setting Plate Assembly

- Select the "INLET" Support Block (**Fig.1**).
- Refer to the Data Chart to establish which Setting Plates are required for the application.
Example: Alfa Romeo 145 2.0 16v TS (96-01) Engine code 323.01 = Plates "A" and "B" (**Fig.2**).
- Fix the Setting Plates to the "INLET" Support Block with the securing screws (Do not tighten fully at this stage) (**Fig.3**).
Note: Plate "A" to the left and Plate "B" to the right, with the "A" and "B" lettering visible.
- Refer to Data Chart to establish which hole number location is required for this application.
Example: Alfa Romeo 145 2.0 16v TS (96-01) Engine code 323.01 = Plate A location "6" and Plate B location "6" (**Fig.2**).
- Select the Location Pins/Chain Assembly and pass the pins through the correct hole locations in the Support Block and into the Setting Plates (**Fig.4**).
- Retain the Location Pins in place by applying pressure to the sides of the Setting Plates whilst fully tighten the setting plate Securing Screws using the allen key provided in the kit (**Fig.5**).

4.2.2 The Exhaust Camshaft Setting Plate Assembly

- Select the "EXHAUST" Support Block (**Fig.6**).
- Refer to Data Chart to establish which Setting Plates are required for the application.
Example: Alfa Romeo 145 2.0 16v TS (96-01) Engine code 323.01 = Plates "C" and "D" (**Fig.2**).
- Fix the Setting Plates to the "EXHAUST" Support Block with the securing screws (Do not tighten fully at this stage) (**Fig.7**).
Note: Plate "C" to the left and Plate "D" to the right, with the "C" and "D" lettering visible.
- Refer to Data Chart to establish which hole number location is required for this application.
Example: Alfa Romeo 145 2.0 16v TS (96-01) Engine code 323.01 = Plate C location "3" and Plate D location "3" (**Fig.2**).
- Select the Location Pins/Chain Assembly and pass the pins through the correct hole locations in the Support Block and into the Setting Plates (**Fig.8**).
- Retain the Location Pins in place by applying pressure to the sides of the Setting Plates whilst fully tighten the setting plate Securing Screws using the allen key provided in the kit (**Fig.9**).

Fig.1



Fig.2

MODEL / engines	Plates / Pin Locations		Cylinder No.Position	
	INLET	EXHAUST	INLET	EXHAUST
ALFA ROMEO				
145 / 146				
1.4 16v.TS (96-01) 335.03	A(5) + B(5)	C(4) + D(4)	2	3
1.6 16v.TS (96-01) 676.01(to 0084340*)	A(5) + B(5)	C(4) + D(4)	2	3
1.6 16v.TS (96-01) 676.01(from 0084340*)	A(4) + B(4)	C(2) + D(2)	2	3
1.8 16v.TS (96-01) 322.01 / 671.06	A(6) + B(6)	C(3) + D(3)	2	3
2.0 16v.TS (96-01) 323.01 / 672.04	A(6) + B(6)	C(3) + D(3)	2	3

Fig.3

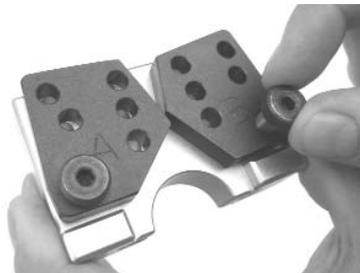


Fig.4

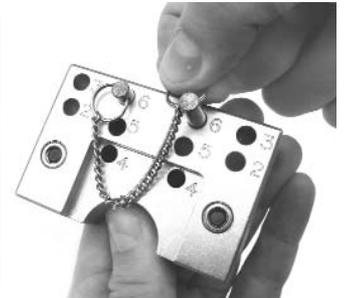


Fig.5

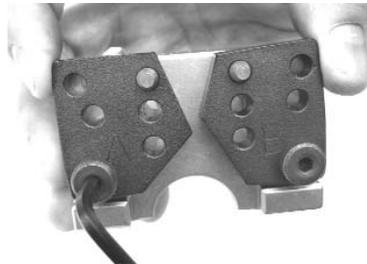


Fig.6



Fig.7

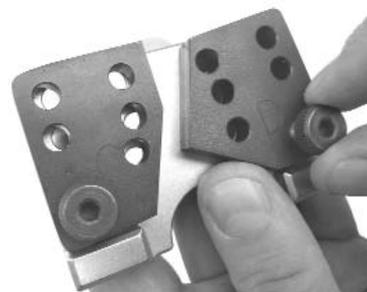


Fig.8

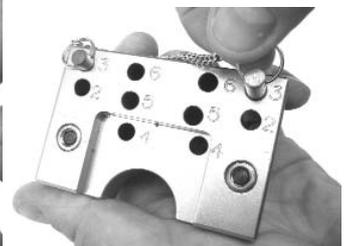
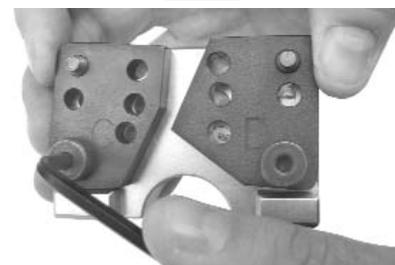


Fig.9



4.3 Fitting the AI-Fi Camshaft Setting Plate Sets to the engine

Camshaft Setting Plate Assemblies are fixed in place of designated bearing caps, at specified cylinders.

- Refer to Data Chart to establish at which cylinder position the "INLET" and the "EXHAUST" Setting Plate Assemblies are to be fitted on to the camshafts for the model/engine.

Example: Alfa Romeo 145 2.0 16v TS (96-01) Engine code 323.01 = Inlet "Cylinder No.2" and Exhaust "Cylinder No.3" (Fig.2).

4.4 For timing belt replacement applications with the old timing belt still in-situ/engine timing correct.

With the crankshaft correctly positioned at TDC No.1 cylinder, the camshaft lobes should be in the correct timed position to accept the AI-Fi Setting Plate Assemblies.

- Remove the bearing caps of the inlet and exhaust camshafts at the appropriate cylinder locations.

NOTE: Clearly mark which is the inlet and exhaust, and keep clean at all times (Fig.10).

- Place the Inlet and Exhaust AI-Fi Setting Plate Assemblies in position over the appropriate camshaft lobes.

NOTE: Ensure that the fixing holes in the Support Blocks match the offset bearing cap holes in the cylinder head (Fig.11).

When viewed from the camshaft sprockets, the lettering on the Setting Plates should be visible.

- CHECK THAT THE BASES OF THE SUPPORT BLOCKS REST ON THE SURFACE OF THE CYLINDER HEAD AND THAT THE SETTING PLATES ARE ALIGNED WITH THE PROFILE OF THE CAMSHAFT LOBES (Fig.12).

- Insert the Flanged Securing Bolts (4) and tighten evenly to 10Nm (Fig.13).

The belt tensioner can now be released and the old belt removed.

NOTE: These Alfa Romeo and Fiat timing belt applications require the camshaft sprockets to be 'free to turn' on the camshaft, when fitting the new timing belt, and therefore it is necessary to slacken the camshaft sprocket bolts.

WARNING: DO NOT use AI-Fi Camshaft Setting Plate Assemblies to counter-hold camshafts in position whilst releasing or tightening the sprocket bolts as this will damage the Setting Plates. AI-Fi Assemblies are for retention of timing position only. A suitable Sprocket Holding Tool MUST BE used to counter-hold the sprockets.

4.5 For camshaft timing applications (when timing belt not in place)

AI-Fi Setting Plate Assemblies can be used to 'set' the camshaft timing on these engines after engine overhaul or repair, and prior to installing a new belt.

The preparation involved in establishing the model/engines, selecting the appropriate AI-Fi parts to create the correct camshaft Setting Plate Assemblies, and determining the correct cylinder location, is exactly the same as described earlier.

The appropriate cylinder locations should not have their camshaft bearing caps fitted.

- Look at the lobe profile form that has been created on the INLET AI-Fi Setting Plate Assembly and using a suitable Sprocket Holding Tool on the camshaft sprockets, turn the INLET camshaft until the camshaft lobe at the appropriate cylinder location is approximately in the same orientation as the Setting Plate Assembly (Fig.14).

- Place the INLET and EXHAUST AI-Fi Setting Plate Assemblies in position over the appropriate camshaft lobes.

NOTE: Ensure that the fixing holes in the Support Blocks match the offset bearing cap holes in the cylinder head (Fig.15).

Fig.2

MODEL / engines		Plates / Pin Locations		Cylinder No.Position	
		INLET	EXHAUST	INLET	EXHAUST
ALFA ROMEO					
145 / 146					
1.4 16v.TS (96-01)	335.03	A(5) + B(5)	C(4) + D(4)	2	3
1.6 16v.TS (96-01)	676.01(to 0084340*)	A(5) + B(5)	C(4) + D(4)	2	3
1.6 16v.TS (96-01)	676.01(from 0084340*)	A(4) + B(4)	C(2) + D(2)	2	3
1.8 16v.TS (96-01)	322.01 / 671.06	A(6) + B(6)	C(3) + D(3)	2	3
2.0 16v.TS (96-01)	323.01 / 672.04	A(6) + B(6)	C(3) + D(3)	2	3

Fig.10

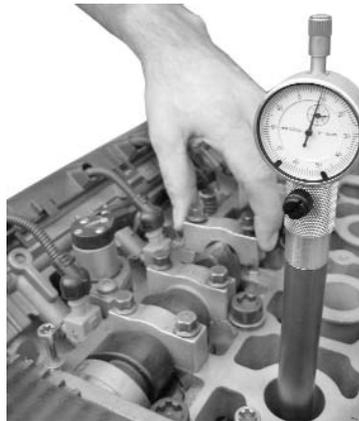


Fig.11

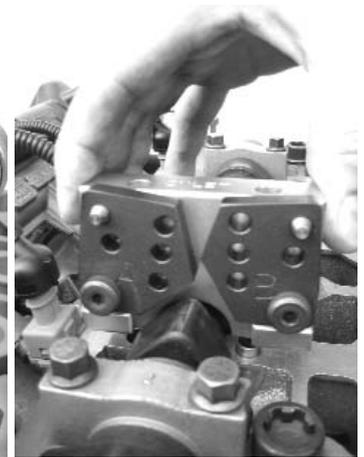


Fig.12



Fig.13

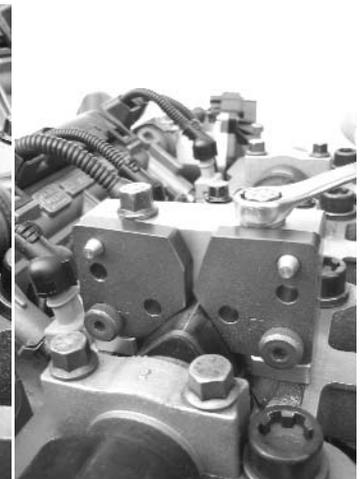
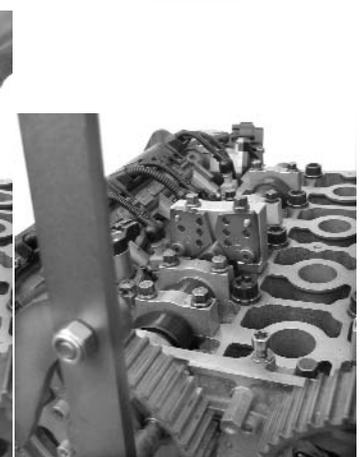


Fig.14



Fig.15



- Using the Sprocket Holding Tool, make any final adjustment required to the camshaft position so the lobe aligns with the Setting Plates (**Fig.16**). Whilst maintaining this position with the Holding Tool, **CHECK THAT THE BASE OF THE SUPPORT BLOCK RESTS ON THE SURFACE OF THE CYLINDER HEAD AND THAT THE SETTING PLATES ARE ALIGNED WITH THE PROFILE OF THE CAMSHAFT LOBES**, and insert the four Flanged Securing Bolts. Tighten evenly to 10Nm.
- Repeat the same procedure with the Exhaust Setting Plate Assembly/camshaft. When fitting the new timing belt the camshaft sprockets must be 'free to turn' on the camshaft and therefore it is necessary to slacken the camshaft sprocket bolts.

Fig.16



WARNING: DO NOT use Al-Fi Camshaft Setting Plate Assemblies to counter-hold camshafts in position whilst releasing or tightening the sprocket bolts as this will damage the Setting Plates. Al-Fi Assemblies are for retention of timing position only. A suitable Sprocket Holding Tool MUST BE used to counter-hold the sprockets.

4.6 Associated Tools

For timing belt replacement applications on these Alfa Romeo and Fiat twin camshaft engines special timing tools will be required, depending upon engine code, to position/lock the crankshaft at TDC (**VS1404 / VS1405/02**) and for timing/balancer belt tension adjustment (**VS1403/04 and VS1409/03**). To remove the belt, the crankshaft pulley must be removed and therefore Flywheel Holding Tool (**VS1403/03**) may also be required.

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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🌐 www.sealey.co.uk
✉ sales@sealey.co.uk