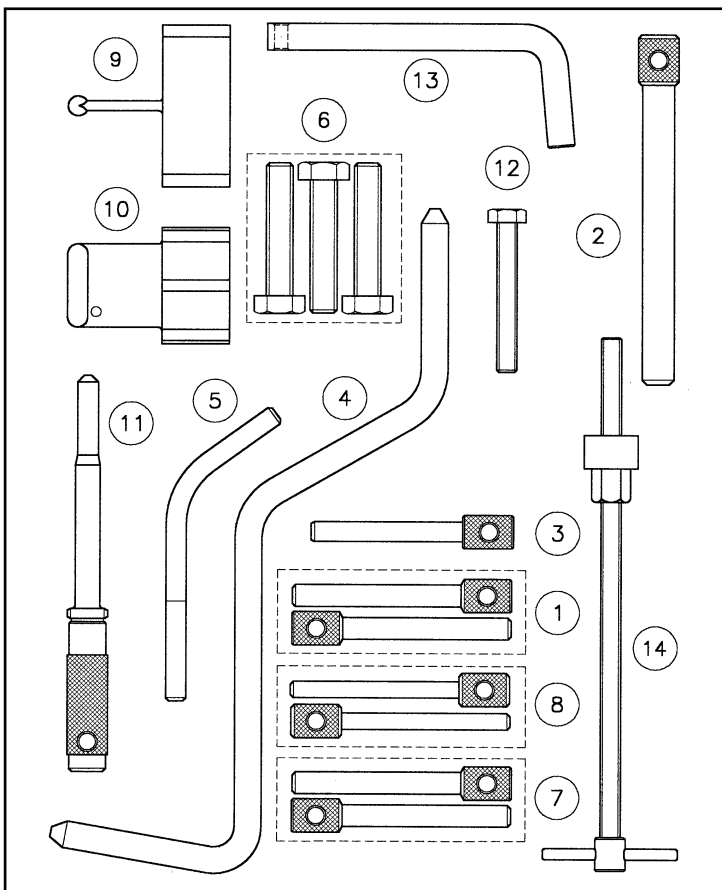


## DIESEL & PETROL ENGINE SETTING/LOCKING TOOL KIT for ROVER, HONDA, LAND-ROVER including twin cam and direct injection



STANDARD PARTS LIST		
1	VS103/2	6.6 Locking pins (pair)
2	VS120/1	Injection pump locking pin
3	VS125/C2	Injection pump locking pin
4	VS125/C6	Flywheel TDC locking pin
5	VS125/P8	Short flywheel TDC locking pin
6	VS125/M8	Locking bolts (set of 3)
7	VS170/1	6.8 Locking pins (pair)
8	VS170/2	5.0 Locking pins (pair)
9	VS170/5	Cam locking tool
10	VS170/6	Cam locking tool
11	VS170/10	Balancer pin
12	VS125/T3	Adjusting bolt
13	VS1253	Tensioner adjuster
14	VS1201	Tensioner tool
-	VS120/84	Case + insert

### 1. INTRODUCTION & APPLICATION

#### 1.1. Introduction

A comprehensive kit of setting/locking and belt tension adjusting tools covering engine timing and timing belt renewal applications on the range of engines in Rover models.

The full range of twin cam engines is covered plus 1.4, 1.5, 1.8 and the latest 2.0 Di diesels.

In addition to the camshaft locking tools and TDC/injection pump pins, special tools are also included to cover required belt tensioning applications.

#### 1.2. Application

Rover Diesel and Petrol Twin Cam engines and these engines fitted in Citroen, Honda, Fiat, LDV, Land Rover, Peugeot, Tata.

Model Application Charts listed for: \* Models with Diesel Engines  
 \* Models with Petrol Engines

#### 1.3. Use with the following tools

Flywheel holding tools (for belt change/crank pulley removal) . . . . .VS1283, VS1287, VS1288  
 Camshaft/Injection pump sprocket holding tool . . . . .VS169

## 2. APPLICATION CHARTS

Diesel Engines including direct injection	VS120 Kit Tools									Optional Tools		
	Camshaft, Injection Pump, Crank/Flywheel TDC Lock							Tensioner Adjustment		Spr't Hold	Flywheel Hold	
	VS170/1	VS103/2	VS120/1	VS125/C2	VS125/C6	VS125/M8	VS125/P8	VS1253	VS1201	VS169	VS1283	VS1287
<b>Rover</b> Metro 1.4D, 114D K9A(TUD3) engines						•	•	•		•		
Metro 1.5D, 115D(95-) V7J(TUD5) engines				•		•	•	•		•		•
Maestro 2.0D/Van/Turbo Montego 2.0D/TD MDi engines	•	•								•		
218SD, 218D Turbo 418SLD/GSD, 418 Tourer D/Turbo XUD7TE/XUD9A engines					•	•				•		
220D, 220SDi, 420D, 420SDi, 620Di, 620SDi 20T2N/20T2R 'L series' engines	•		•						•	•		
<b>Citroën</b> AX 1.4D(-94), ZX 1.4D TUD3(K9A) engines						•	•	•		•		
Visa 17D, BX 1.7D/TD/1.9D(-93) ZX 1.8D/1.9D(91-), 1.8TD/1.9TD(92-) Xsara 1.9D/TD, Xantia 1.9D/TD(93-) Synergie/Evasion 1.9TD, C15D 1.8D Berlingo 1.8D/1.9D Dispatch/Jumpy 1.9D/TD Relay/Jumper 1.9D/TD XUD7/XUD9 engines					•	•				•	•	
Xantia 2.1TD(95-), XM 2.1D/TD Synergie/Evasion 2.1TD XUD11 engines					•	•				•	•	
<b>Fiat</b> Ulysse/Scudo 1.9TD XUD9TF(D8B) engines					•	•				•	•	
<b>FSO</b> Caro 1.9D(94-) XUD9 engines					•	•				•	•	
<b>Honda</b> Accord 2.0TDi 20T2N engines	•		•						•	•		
<b>LDV</b> 200 1.9D, Pilot 1.9D(94-) XUD9A engines					•	•				•	•	
<b>Land Rover</b> Freelander 2.0D 20T2 'L series' engines	•		•						•	•		
<b>Peugeot</b> 106 1.4D(-94) TUD3(K9A) engines						•	•	•		•		
205 1.8D/TD/1.9D, 305 1.8D/1.9D(-89) 306 1.9D/TD(93-) 309 1.8D/TD/1.9D(-93) 405 1.8TD/1.9D/TD(92), 406 1.9TD 806 1.9TD J5/Talbot Express 1.9D(-94) Partner 1.8D/1.9D, Expert 1.9D/TD Boxer 1.9D/TD XUD7/XUD9 engines					•	•				•	•	
406 2.1TD(95-), 605 2.1D/TD 806 2.1TD XUD11 engines					•	•				•	•	
<b>TATA</b> Loadbeta 1.9D(94-) XUD9(483DL 43/44) engines					•	•				•		

## 2. APPLICATION CHARTS - Continued

Petrol Engines including twin cam  Models/engines	VS120 Kit Tools						Optional Tools	
	Twin Camshaft, Balance Shaft, Crank/Flywheel TDC Lock					Tensioner Adjustment	Sprocket Hold	Flywheel Hold
	VS170/1	VS170/2	VS170/5	VS170/6	VS170/10	VS125/T3	VS169	VS1288
<b>Rover</b> Metro GTa/GTi 16v(-95), 200Vi 214 16v(89-) 216 16v Cabrio/Coupe(95-) 218 16v, 414 16v(89-) 416 16v/Tourer(95-) K16/16K16/18K16 TWIN CAM engines				•			•	•
216 GTi 16v(-95), 416 GTi 16v(-95) D16A8/D16A9 TWIN CAM engines		•						•
MGF 1.8, Coupe 1.8i(97-) MPI/VVC TWIN CAM engines				•			•	
220 16v/Turbo, 420 16v, 620Ti 820 16v, Vitesse 2.0 16v/Turbo 20T4(T16) and later M16 TWIN CAM engines	•		•				•	
618, 620, 623 F18A3/F20Z1/F20Z2 sohc H23A3 TWIN CAM engines					•	•		
820 8v 20HD (M8) engines	•							
<b>Honda</b> Civic 1.6 VTI BA16A TWIN CAM engines		•					•	
Accord 1.8, 2.0, 2.2(-93) Accord 2.0i, 2.2 V-Tec(93-) F18A/F20A/F22A/F20Z1/F20Z2/F22Z2 engines					•	•		
Accord/Prelude 2.0 16v(-90) B20A7 TWIN CAM engines		•						
Accord 2.3i(93-) Prelude 2.2 V-Tec/2.3i(93-) H22A2/H23A2/H23A3 TWIN CAM engines					•	•		
Shuttle 2.2i F22B8 engines					•	•		
<b>Land Rover</b> Discovery MPI 2.0 16v 20T4 TWIN CAM engines	•		•				•	
Freelander 1.8i 16v TWIN CAM engines				•			•	

### 3. SAFETY INSTRUCTIONS

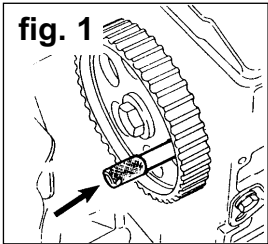
- WARNING!** Ensure all health and safety, local authority, and general workshop practice regulations are strictly adhered to when using tools.
  - DO NOT use tools if damaged.
  - Maintain tools in good and clean condition for best and safest performance.
  - If required, ensure the vehicle to be worked on is adequately supported with axle stands, ramps and chocks.
  - 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!** Locking Pins must NOT be used to hold the crankshaft whilst releasing or tightening the pulley bolt. Locking Pins are for retention of timing position only. Always use the appropriate Flywheel Holding Tool.
- IMPORTANT:** Always refer to the vehicle manufacturer's service instructions, or proprietary manual to establish the current procedure and data. These instructions for use are provided as a guide only.

### 4. INSTRUCTIONS FOR USE

**WARNING!** Ensure you have read and understood chapter 3 safety instructions before commencing.

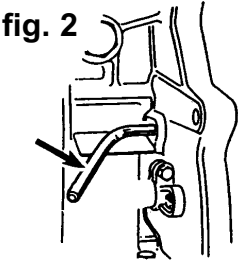
#### 4.1. DIESEL ENGINE CAMSHAFT & INJECTION PUMP LOCKING PINS/BOLTS VS103/2, VS120/1, VS170/1, VS125/C2, VS125/M8

1. For timing belt renewal on diesel engines in Rover models, the camshaft and/or injection pump are 'locked' in their timed position by using correctly sized locking pins.
2. Once all the timing marks are aligned these pins pass through holes in the sprockets, or cam cover on MDi engines, into datum holes in the engine to 'lock' the sprocket and retain engine timing position (fig.1).
3. VS125/M8 Locking Bolts are used in the same way, but are threaded through to 'lock' the sprockets so that the drive belt can be removed without disturbing the engine timing.



#### 4.2. FLYWHEEL TDC LOCKING PINS. VS125/C6, VS125/P8 and VS170/1

1. These are designed to pin and lock the engine at TDC by alignment of a datum point on the flywheel with a hole in the rear flange of the engine.
2. Position the locking pin in the access drilling behind the starter motor and rotate the engine by hand until the pin engages with the flywheel timing hole fig. 2.



**USAGE**

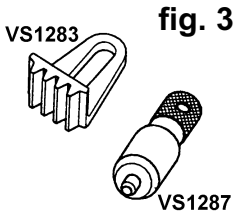
1.4D engines .....	VS125/M8 Cam/Inj. Pump(2)		
	VS125/P8 Flywheel		
1.5D engines .....	VS125/M8 Camshaft	218D/418D engines.....	VS125/M8 Cam/Inj. Pump
	VS125/C2 Inj. Pump		VS125/C6 Flywheel
	VS125/P8 Flywheel		
2.0 MDi engines .....	VS170/1 Cam/Flywheel	2.0Di/SDi engines .....	VS120/1 Inj. Pump
	VS103/2 Inj. Pump(2)		VS170/1 Flywheel

**WARNING!** Locking Pins must NOT be used to hold the crankshaft whilst releasing or tightening the pulley bolt. Locking Pins are for retention of timing position only. Always use the appropriate Flywheel Holding Tool.

#### 4.3. FLYWHEEL HOLDING TOOLS Associated Tools - not in kit

It is often necessary to remove the crankshaft pulley when replacing the timing belt. The pulley bolt has a high torque loading and the engine must be 'locked' safely with the correct Flywheel Holding Tool when releasing/tightening the bolt.

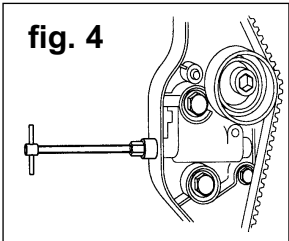
Use VS1283 or VS1287 Holding Tools (fig.3) for diesel engine applications. For the specific model/engine coverage for each tool - refer to the Application Charts.



#### 4.4. TENSIONER ADJUSTMENT TOOLS

##### 4.4.1. VS1201 Tensioner Tool - Rover 2.0Di/2.0SDi 'L series' engines

These 20T2N/20T2R engines require special tool VS1201 to retract the tensioner assembly during applications requiring timing belt removal/replacement. When removing the belt, the tensioner nut is slackened and the tensioner access plug removed to allow VS1201 to be fitted and to pull back the tensioner plunger (fig.4).



##### 4.4.2. VS1253 Tensioner Adjuster - 1.4D & 1.5D engines

VS1253 is a specialised wrench for adjusting the timing belt tension and on early engines VS1253 can also be used, with an appropriate weight, to establish timing belt tension.

##### 4.4.3. VS125/T3 Tensioner Adjusting Bolt

VS125/T3 is used to lock the tensioner arm whilst replacing the timing belt on Rover/Honda sohc and twin cam engines - see Application Charts.

#### 4.5. TWIN CAM PETROL ENGINE SETTING/LOCKING TOOLS

##### 4.5.1. VS170/5 (Orange) - later M16 / T16 engines VS170/6 (Black) - K16 / 18K16 / MPi / VVC engines Camshaft Locking Tools

These precision formed tools are colour-coded for model use identification.

1. Insert the locking tool between the two camshaft sprockets, locating firmly into the gear teeth. This locks the sprockets in position and prevents them from rotating out of their timed position when the timing belt is removed (fig 5).
2. **IMPORTANT:** It is essential that the camshaft timing marks align before inserting locking tool and that the positions of these timing marks are clearly identified.
3. When installing a new timing belt it is usual to start at the crankshaft. Once the belt is fitted and tensioned, the locking tools are removed and the crankshaft turned two revolutions by hand.  
**IMPORTANT:** a) All timing marks must re-align exactly when returning to the timed position.  
b) It is essential to check and follow vehicle manufacturer's advice on belt tensioning procedure.

##### 4.5.2. VS170/2 Camshaft Locking Pins.

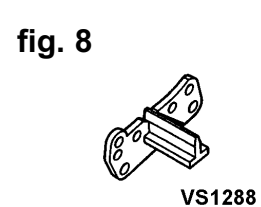
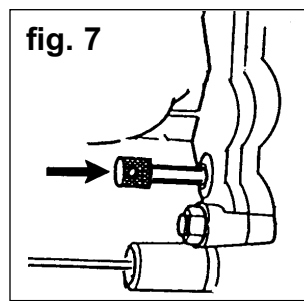
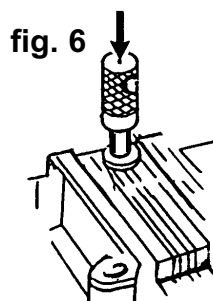
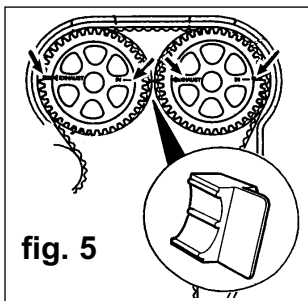
On certain twin cams, camshafts are locked in position on their timing marks by use of two locking pins. This method of locking is achieved by inserting the correct pins through assigned holes in the camshaft housing, engaging and locking the camshafts in position (fig. 6). See Application Charts for specific models/engines cam locking tool/method.

##### 4.5.3. VS170/1 Flywheel Locking Pins - Rover 2.0 M8, M16, T16 engines

Locking pins are also used to lock the crankshaft in its timing position. The crankshaft is locked in place by inserting the correct diameter locking pin through a hole in the gearbox mounting back plate to engage a corresponding hole in the flywheel. (fig. 7).

**NOTE:** This may not necessarily be at TDC. Rover timing specifications can lock the flywheel at a position 90 degrees BTDC. Always check specifications.

- ❑ **WARNING!** Locking Pins must NOT be used to hold the crankshaft whilst releasing or tightening the pulley bolt. Locking Pins are for retention of timing position only. Use the appropriate **Flywheel Holding Tool VS1288 (fig 8)** for petrol engine applications. For specific model/engine coverage refer to the Application Charts.



##### 4.5.4. VS170/10 Balancer Shaft Locking Pin

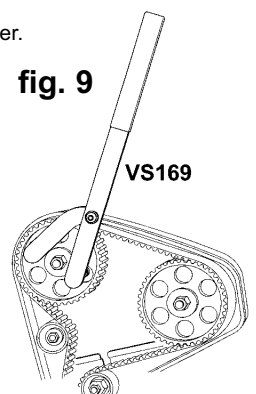
Some Rover, Honda sohc and twin cam engines have balancer shafts connected to the crankshaft pulley by a balancer shaft belt. During removal and refitting of timing belt balancer shaft belt is removed.

1. To refit this belt, once the new timing belt has been fitted, the crankshaft and camshaft timing marks must be aligned and tensioner arm locked.
2. The balancer shaft plug is removed, VS170/10 Locking Pin inserted and the shaft rotated until the pin locks into the hole in the shaft.
3. The timing marks of the front balancer shaft are aligned and the crankshaft pulley removed to fit the belt.
4. Loosen tensioner and remove locking pin.
5. Refit plug.
6. Crankshaft pulley is installed and crankshaft rotated a full turn anti-clockwise before unlocking and tightening tensioner.
7. Re-tighten crankshaft pulley bolt to specification.

#### 4.6. CAMSHAFT/INJECTION PUMP SPROCKET HOLDING TOOL

##### VS169 Sprocket Holding Tool - Optional tool, not in list

1. VS169 is used to counter-hold the sprocket whilst releasing or re-tightening the sprocket nut/bolt (fig.9) .
2. It locates in holes/slots in the sprocket and is particularly useful for retaining the front camshaft sprocket on the 20T2N/20T2R 'L series' diesel engines in order to release the rear sprocket.



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