

DIESEL & PETROL ENGINE SETTING/LOCKING TOOL KIT FORD CAR & CAR-DERIVED VANS

1. INTRODUCTION & APPLICATIONS

1.1. INTRODUCTION

VS1012 Setting/Locking Tool Kit covers timing belt replacement applications on Ford 1.8 diesels (including Di Endura) and 1.25, 1.4, 1.6, 1.7, 1.8 & 2.0 petrol twin cam (Zetec) 16v. engines in Ford cars and car-derived vans.

1.2. APPLICATIONS

Ford: Fiesta, Escort/Orion, Focus, Puma, Sierra, Mondeo, Cougar, Courier/Kombi & P100
 Engines: 1.8D/TD/Di Diesels and 1.25 to 2.0 Petrol Twin Cam 16v. (Zetec) engines.

Mazda: 121 1.25 Twin Cam Petrol engine.

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

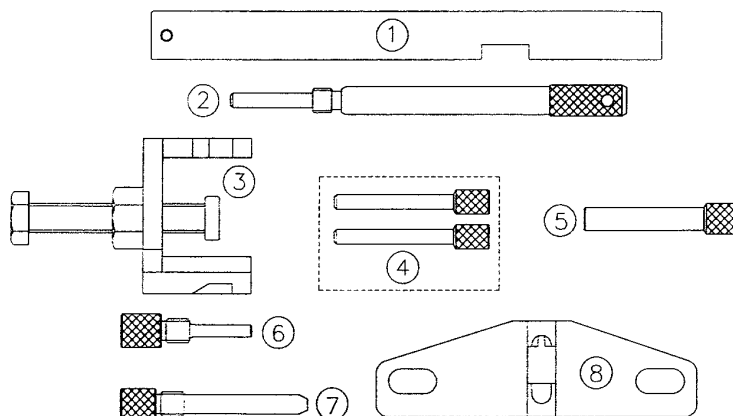
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| 8. | VS1012/02 | Flywheel Locking Tool |
| -- | VS1012/84 | Case + Insert |

3.2. Associated Tools & Applications

Use with:

- | | |
|---|--------|
| Crankshaft Pulley Remover & Installer Set | |
| 1.25/1.4/1.6 Petrol Engines | VS1013 |
| Sprocket Holding Tool..... | VS169 |



4. INSTRUCTIONS

4.1. Ford DIESEL engines - 1.8D/TD/Di

These Ford 1.8D/TD/Di diesel engines use a common Crankshaft TDC Location Pin (VS101/2). Up to 1996, 1.8 diesels used Locking Pins to retain the timing position of both the camshaft and injection pump.

From 1996 the pin retaining the camshaft was replaced by a Setting Plate (VS115/01), which locates into a slot in the end of the camshaft.

WARNING! These timing tools must **NOT** be used to counterhold the crank or camshaft for removing/releasing pulleys or sprockets. They are for retention of timing positions only. Use the appropriate holding tool.

4.1.1. VS101/2 Crankshaft TDC Location Pin

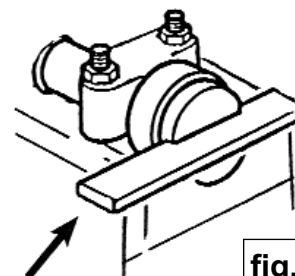
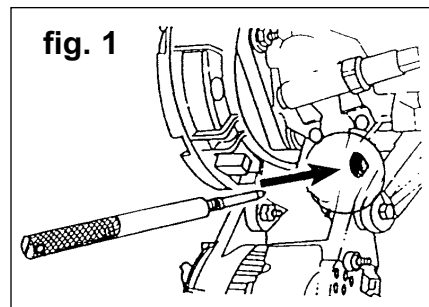
This is designed to screw into the cylinder block and provide a stop, against which the crank web is positioned to set TDC.

- Turn the engine in the normal direction of rotation until the slot in the injection pump sprocket is approx. in the 11 o'clock position.
- Remove the plug from the cylinder block access hole and screw in VS101/2 - fig. 1.
- Slowly and carefully turn the crankshaft clockwise until the crankshaft web rests on the Locking Pin. No.1 cylinder is now set at TDC on the ignition stroke.

4.1.2. VS115/01 Camshaft Setting Plate

On Ford 1.8 diesel engines, 1996 onwards, VS115/01 Setting Plate is used to accurately align an off-centre datum slot in the end of the camshaft with the top face of the camshaft housing, to hold the camshaft in the timed position - fig. 2.

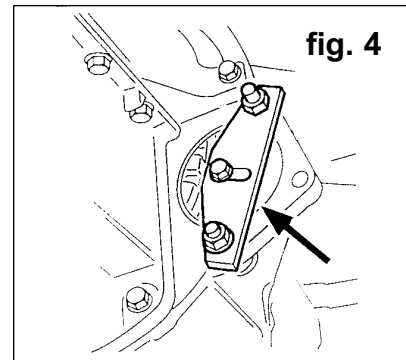
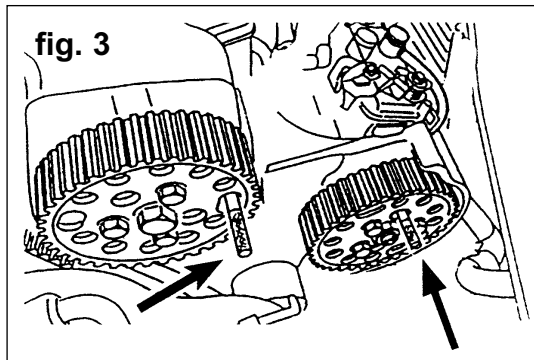
A notch is designed into the Setting Plate to accommodate the raised part of the housing.



4.1.3. VS101/3 and VS101/4 Locking Pins

Locking Pins are designed to pass through datum holes in the camshaft or injection pump sprockets and locate in fixed holes on the engine. On Ford 1.8 diesels before 1996 the camshaft and injection pump are retained in the timed positions by the use of Locking Pins - fig. 3.

From 1996 the camshaft is held by Setting Plate VS115/03 but the injection pump is still retained by a Locking Pin - VS101/4 (9.5mm) for Bosch injection pumps - VS101/3 (6.0mm) for CAV/Rotodiesel pumps.



4.2. 1.8Di Endura Direct Injection

The Endura 1.8 Direct Injection engine utilises a chain drive from the crankshaft to the injection pump and a tooth drive belt from the injection pump to the camshaft.

IMPORTANT: A new belt **MUST** be installed if the tension has been released from an existing belt.

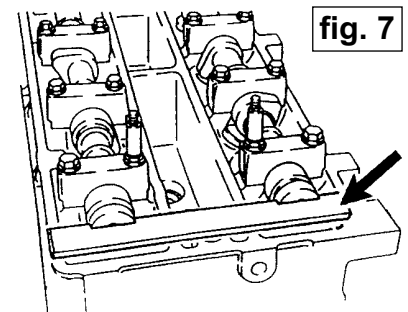
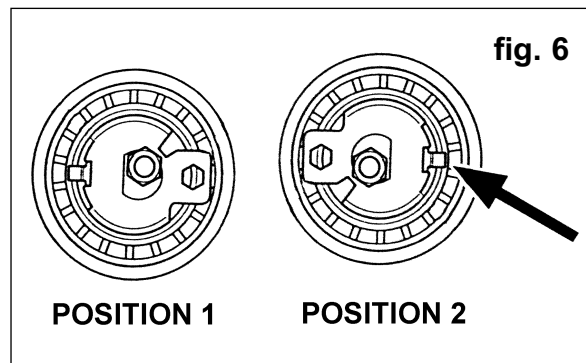
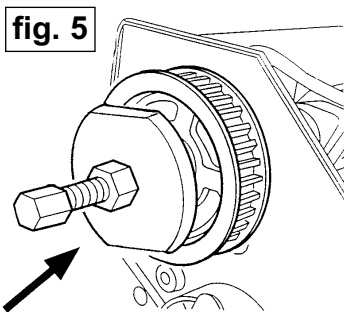
4.2.1. VS1012/02 Flywheel Locking Tool

1. For renewal of the camshaft drive belt the crankshaft is located at TDC using the VS101/2 Pin as with the 1.8TD, but additionally VS1012/02 Flywheel Locking Tool is fitted - fig. 4, as the crankshaft web **MUST** be locked against the VS101/2 Pin.

IMPORTANT: Ensure that the crankshaft does not move whilst fitting VS1012/02, and that VS1012/02 engages the flywheel correctly.

2. Fit the VS115/01 Setting Plate into the off-centre slot in the rear of the camshaft, as with the 1.8TD engine.

3. It will be necessary to support the engine and remove the front engine mounting. The belt tensioner is then slackened and turned clockwise away from the belt.



4.2.2. VS1012/01 Camshaft Sprocket Remover

The camshaft sprocket must be free to turn on its taper.

1. Using a holding tool, slacken the camshaft sprocket bolt and then loosen the sprocket from its taper using VS1012/01 Remover - fig. 5.
2. Remove old belt.

4.2.3. Fitting Belt

When fitting a new belt the automatic tensioner must be in Position 1.

1. Fit belt and then turn tensioner anti-clockwise until pointer is in Position 2 - fig. 6.
2. Counter-hold the camshaft sprocket and tighten the sprocket bolt.
3. Remove all locking tools and rotate the engine six times. Refit crankshaft pin and flywheel locking tool. Check that the tensioner pointer is in Position 2 and that the camshaft setting plate can be inserted.
4. The injection pump timing can be checked by locating the crankshaft at TDC using Pin VS101/2 and inserting VS101/3 Pin in the injection pump sprocket.

4.3. Ford PETROL engines - Twin Camshaft 16v.

4.3.1. VS115/01 Camshaft Setting Plate

On all Ford 16v. twin cam engines (Zetec), VS115/01 Setting Plate is used to lock the camshafts in the correct timing position via a slot in the rear of the camshafts - fig. 7.

1. For timing belt replacement on these applications it is important to ensure that the crankshaft is at TDC (see VS115/02 and VS115/03), and that VS115/01 Setting Plate is in position on the camshafts. The tensioner can then be slackened/compressed and the timing belt removed.
2. With the setting plate locking the camshafts in position, the cam sprockets can be loosened, using a holding tool to counter-hold the sprocket whilst releasing the centre bolt. Some camshafts provide a hexagon to locate a spanner to counter-hold the camshaft.
3. Using the appropriate Location Pin (see VS115/02 and VS115/03), ensure that the crankshaft is at TDC before fitting the new the belt in an anti-clockwise direction.
4. The tensioner should be applied following the manufacturer's procedure. Using a holding tool, counter-hold the camshaft sprockets whilst tightening the centre bolt. Remove setting plate and TDC pin.
5. Rotate the engine a least two revolutions, return to TDC position and insert the location pin. Re-check camshaft position by ensuring that the setting plate can be easily inserted into the slots. If not, re-check tensioning procedure again.

Note: For Fiesta/Escort 1.6i/1.8i and Mondeo 1.6/1.8/2.0 (-98) 16v. engines, only VS115/01 Cam Setting Plate is used. A crank pin entry point is not provided.

4.4. VS115/02 and VS115/03 Crank TDC Location Pins

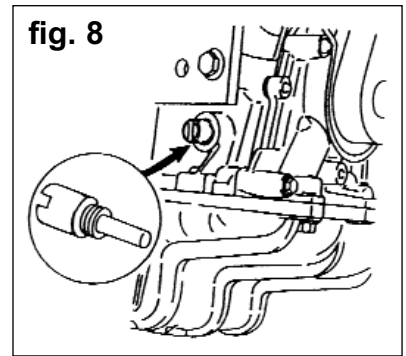
TDC Location Pins are used, in conjunction with VS115/01 Cam Setting Plate, to ensure that the correct timing position is established and maintained during timing belt renewal, as follows:

VS115/02 - Fiesta 1.25/1.4/1.6, Focus 1.4/1.6, Puma 1.4/1.6/1.7 16v.

VS115/03 - Focus 1.8/2.0, Mondeo 1.6/1.8/2.0 (98-), Cougar 2.0 16v.

1. Remove the cylinder block blanking plug to allow the appropriate pin to be screwed into position - fig. 8.
2. Carefully rotate the crankshaft until the web rests against the pin.

Note: On the smaller Zetec engines in Fiesta and Puma, specialised tools are required to remove and install the crankshaft pulley - see VS1013 Crankshaft Pulley Remover & Installer Set.



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.

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