



TIMING TOOL KIT FOR VAG 1.0/1.2TSI, 1.4TSI,1.5TSI BELT DRIVE

MODEL NO: **VSE7400**

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 & 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. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.



Refer to
instructions



Wear eye
protection

1. SAFETY

- ☐ **WARNING!** Wear approved eye protection. Wear appropriate Personal Protective Equipment. A full range of Personal Protective Equipment is available from your Sealey stockist.
- ☐ **WARNING!** Ensure that Health & Safety, Local Authority Regulations and general workshop practice Regulations are adhered to when using tools.
- x** **DO NOT** use tools if damaged.
 - ✓** Maintain tools to ensure that they are in an adequate condition for safe use and optimum performance.
 - ✓** Ensure that a vehicle that has been raised by a jack is adequately supported. Use axle stands.
 - x** **DO NOT** attempt to start or move a vehicle whilst in gear and with timing devices fitted.
 - ✓** Wear suitable clothing to avoid snagging. **DO NOT** wear jewellery. Tie back long hair.
 - ✓** Account for all tools, parts and components being used. **DO NOT** leave these in or near the engine. Return tools to suitable storage after use.
 - ✓** When not in use, store in a safe, dry childproof place.
 - ✓** Keep children and unauthorised persons away from the work area.
- 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 correct procedure and data.
- ☐ **WARNING!** The warnings, cautions and instructions in this manual cannot cover all possible conditions and situations. The Operator / user must apply caution and common sense (good practical sense).
- ✓** When timing an engine, always prevent the engine from being turned over. Use a notice and / or inhibit the engine.
- ☐ **WARNING!** Incorrect or out of phase camshaft timing can result in contact between the valve head and the piston crown. This will cause damage to the engine.

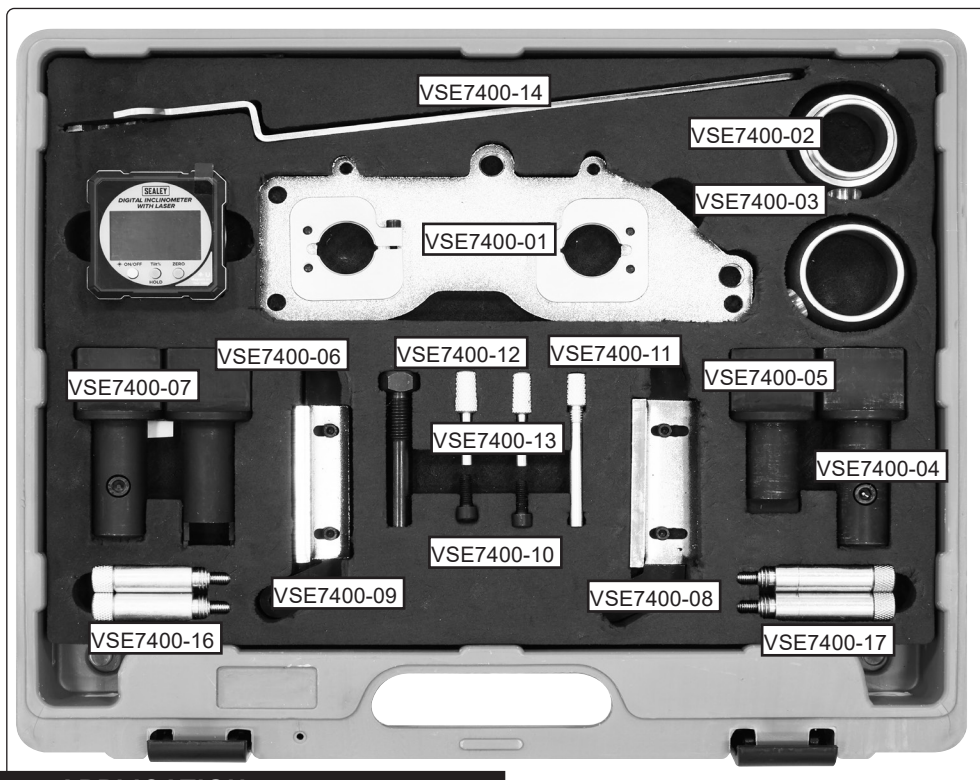
2. INTRODUCTION

Contains tools vital for setting and locking the engine. Suitable for use with VAG 1.0/1.2TSi, 1.4TSi,1.5TSi with Belt Drive engines. This kit contains tools for setting the camshaft timing without the need for OEM diagnostic equipment.

3. CONTENTS

Model number	Product name
VSE7400-01	Adaptor/Clamping Plate
VSE7400-02	Inlet Camshaft Spacer Boss
VSE7400-03	Exhaust Camshaft Spacer Boss
VSE7400-04	Inlet Camshaft Adaptor (EA211 EVO)
VSE7400-05	Exhaust Camshaft Adaptor (EA211 EVO)
VSE7400-06	Inlet Camshaft Adaptor (without ACT)
VSE7400-07	Exhaust Camshaft Adaptor (without ACT)
VSE7400-08	Inclinometer Reference Bar
VSE7400-09	Inclinometer Reference Bar
VSE7400-10	Inclinometer Bar Fixing Bolts (2)
VSE7400-11	Camshaft (Water Pump) Sprocket Timing Pin
VSE7400-12	Crankshaft Timing Pin
VSE7400-13	Datum Pins (2) / Datum Pins (2)
VSE7400-14	Tensioner Pulley Wrench
AK9991	Inclinometer Digital with Laser
VSE7400-16	Mounting Spacers/Screws (2) (1.2)
VSE7400-17	Mounting Spacers/Screws (2)

OEM Tools	T10499, T10340, VAS 611 007
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4. APPLICATION

Audi	A1 Citycarver (19-24), A1 Allstreet (19-24), A1 Sportback (15-24), A3 (13-20), A3 saloon (13-23), A3 Sportback (12-23), A3 cabriolet (14-21), Q2 (16-24), Q3 (15-24), Q3 Sportback (19-24)
Seat	Alhambra (15-24), Arona (17-24), Ateca (18-20), Ibiza (15-24), Leon (12-24), Leon ST (13-24), M11 (12-20), Tarraco (19-24), Toledo (15-19)
Skoda	Citygo (12-19), Fabia III (17-21), Fabia III Estate (15-22), Kamiq (19-23), Karoq (17-24), Kodiaq (17-23), Octavia III (16-20), Octavia IV (20-24), Rapid (15-24), Rapid Spaceback (17-19), Scala (19-23), Superb III (15-23), Yeti (15-17), Yeti Outdoor (15-17)
Volkswagen	Areton (19-24), Beetle (15-18), CC (15-17), Golf VI Cabriolet (15-16), Golf VII (12-24), Golf VII Estate (13-24), Golf VIII (20-24), Golf Sportsvan (14-21), Caddy (15-21), Multivan (21-24), Passat (14-24), Polo (14-24), Scirocco (15-18), Sharon (15-24), T-Cross (20-24), Tiguan (16-24), T-Roc (17-24), T-Roc Cabriolet (19-24), Tiguan Allspace (17-24), Touran (15-24), Load Up! (16-20), Up! (16-24)

5. ENGINE CODES

1.0TSi:	CHZA, CHZB, CHZC, CHZD, CHZF, CHZJ, CHZK, CHZL, CPGA, DBYA, DKJA, DKLA, DKLB, DKLC, DKLD, DKRA, DKRB, DKRC, DKRF
1.2TSi:	CJZA, CJZB, CJZC, CJZD, CYVA, CYVB, CYVD
1.4TSi:	CHPA, CMBA, CPVA, CPVB, CPWA, CUKB, CUKC, CXSA, CZCA, CZDA, CZDD, DGEA, DGEB, DJKA
1.5TSi:	DACA, DACB, DADA, DFYA, DPBA, DPCA, DPBE

6. INSTRUCTIONS

NOTE: The Sealey VSE7400 Timing Tool Kit has been developed to check, set and align the engine camshaft timing on the VAG 3 and 4 cylinder EA211 engines, including ACT variants. Using this Timing Tool Kit means there should be no need to use the VAG electronic angle setting equipment.

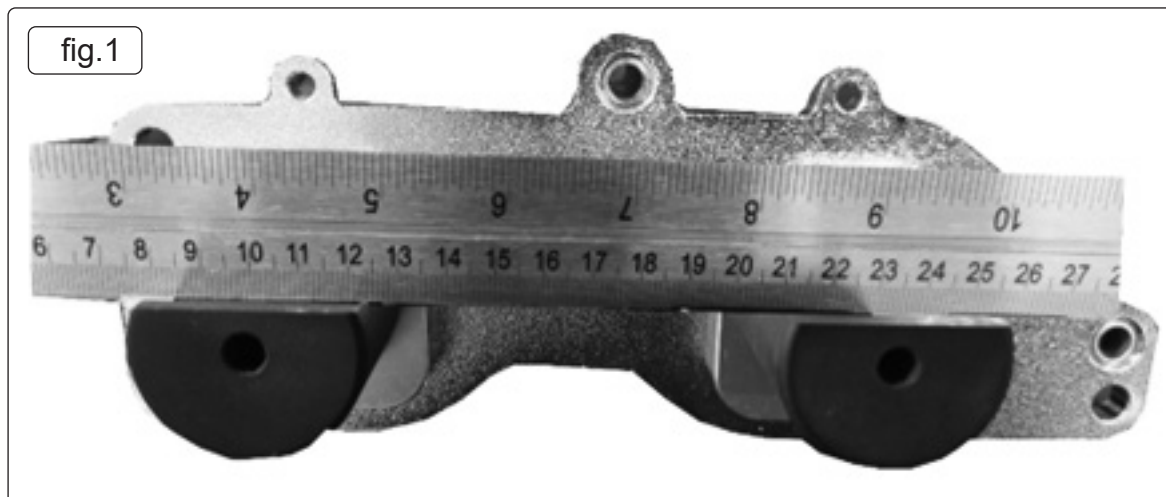
Included in the Timing Tool Kit is a Sealey digital inclinometer, when used with the adaptors and alignment tools in this kit, and following the correct process, the camshaft timing will be set to the manufacturer's specification.

NOTE: It is essential to use a counter hold such as the Sealey VS754 Pulley Holding Set when removing/refitting camshaft sprocket fittings.

6.1. PREPARING THE VSE7400-01 ADAPTOR/CLAMPING PLATE

- 6.1.1. Select the correct Inlet and exhaust adaptors (depending upon engine/application) and fully insert them into the Adaptor/Clamping Plate. Ensure they are level and in alignment using a suitable straight edge. (fig.1)

NOTE: Depending upon engine type, there are varying locking datum points on the ends of the camshafts, some have slots, some have a 'D' shape. Consult the manufacturer's data for your engine type to ensure the correct positioning is adhered to. This kit contains the correct tools for all current variants.

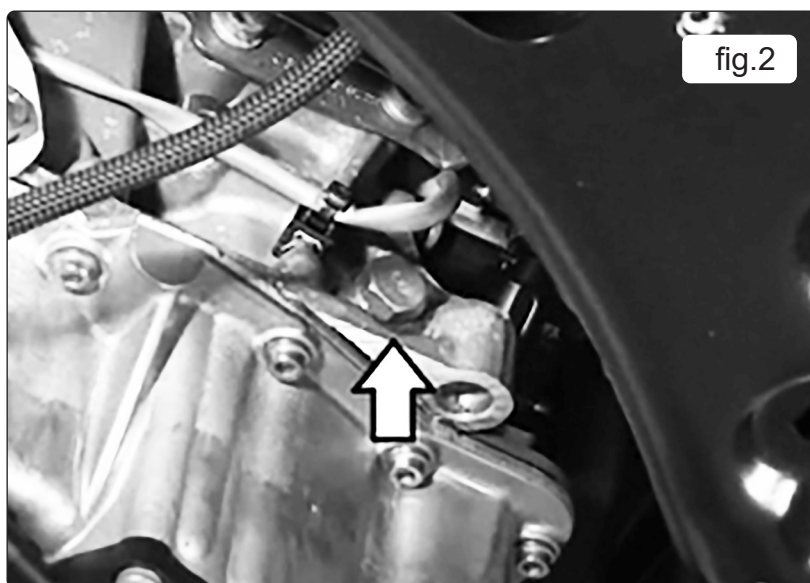


- 6.1.2. Using a 3mm Hex Key, firmly tighten the adaptor clamping plates by hand.
6.1.3. Using a 6mm Hex Key socket and torque wrench, apply a torque of 25Nm to the adaptors to ensure that no rotation can occur.

6.2. CHECKING THE CAMSHAFT TIMING

NOTE: Access will be required to both ends of the camshaft drive system, this will require the removal of some engine ancillary components.

- 6.2.1. Remove the crankshaft timing pin blanking plug, fit the VSE7400-12 Crankshaft Timing Pin and tighten to 10Nm. (fig.2)



NOTE: If the Crankshaft Timing Pin will not fully screw in, remove it and rotate the crankshaft through $\frac{1}{4}$ of a turn clockwise. Refit and tighten to 10Nm.

- 6.2.2. Rotate the crankshaft clockwise until it contacts the Crankshaft Timing Pin.

NOTE: Some engine variants have a water pump driven off the end of the camshaft. On these variants, fit the VSE7400-11 Camshaft (Water Pump) Sprocket Timing Pin through the water pump sprocket and into the datum hole in the cylinder head. (fig.3)

NOTE: If the datum hole in the pulley is 180 degrees out, remove the VSE7400-12 Crankshaft Timing Pin, rotate the crankshaft 360 degrees. Refit the VSE7400-12 Crankshaft Timing Pin and the VSE7400-11 Camshaft (Water Pump) Sprocket Timing Pin.



- 6.2.3. Once the initial mechanical alignment process has been completed, remove the VSE7400-11 Camshaft Sprocket Locking Pin, using a suitable pulley holding tool such as the Sealey VS754, remove the water pump drive pulley fixing bolt and remove the pulley from the camshaft.

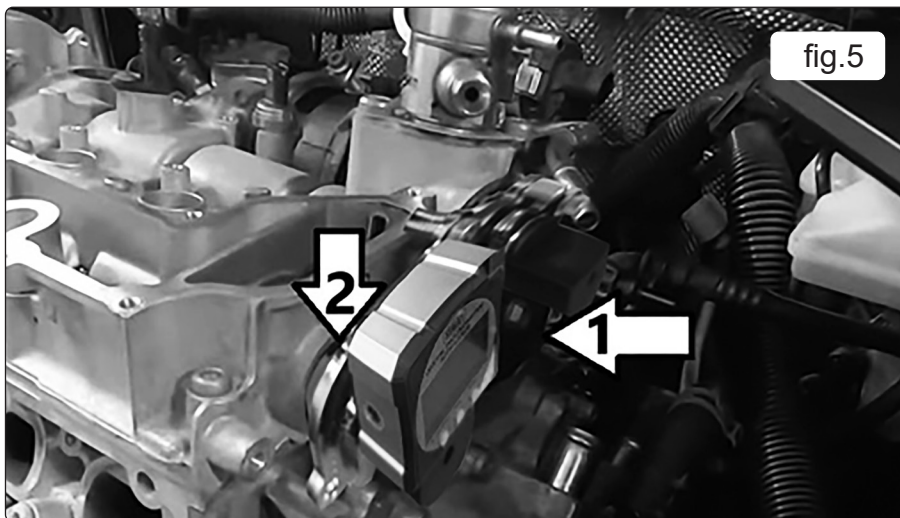
6.3. FITTING THE CAMSHAFT TIMING KIT:

- 6.3.1. To accurately check and set the camshaft timing, it is necessary to use the VSE7400-01 Adaptor/Clamping Plate and an Inclinator.
- 6.3.2. Depending upon application, fit the VSE7400-08 or VSE7400-09 Inclinator Reference Bar using the two screws provided. (fig.4)

NOTE: it is important this area is clean to ensure the bar fits flush against the bottom of the cylinder head along its full length. This is important because this is the level reference point for the vehicle, and subsequent camshaft angle changes.



- 6.3.3. Fit the VSE7400-01 Adaptor/Clamping Plate as previously assembled ensuring the correct adaptors are used, and that the inlet and exhaust adaptors are aligned to their respective camshafts and fully engaged in the camshafts. (fig 5.1)
- 6.3.4. Using a 5mm Hex Wrench, tighten the clamping screws on the adaptors to 15Nm (fig 5.2) to ensure the camshafts cannot be rotated.



6.4. CHECKING THE CAMSHAFT TIMING:

- 6.4.1. Place the VSE7400-15 Inclinator on a flat surface and switch it on, allow the reading to stabilise.
- 6.4.2. Place the inclinometer upside down on the inclinometer reference bar. (fig.4)
- 6.4.3. Press ZERO to set the inclinometer to 00.0.
- 6.4.4. Place the inclinometer the correct way up onto the flat area on the inlet adaptor and record the value shown.
- 6.4.5. Repeat this operation for the exhaust adaptor and record the value shown. (fig.6)



NOTE: Ensure to record the value of the reading. Arrow up = a negative angle, arrow down = a positive angle. The arrows showing on the inclinometer indicate the direction of rotation to get to zero.

- 6.4.6. Data recorded will now have to be compared with the specific data supplied by the manufacturer for the individual engine. An example of this is given here.

NOTE: THIS EXAMPLE IS PURELY FOR DEMONSTRATION PURPOSES ONLY.

Engine code DADA is a 1.5TSi engine.

The specified inlet timing angle $-0.3^\circ \pm 1.2^\circ$ = range of -1.5° to $+0.9^\circ$

The specified exhaust timing angle $+1.1^\circ \pm 1.2^\circ$ = range of -0.1° to $+2.3^\circ$

Always refer to specific engine tolerances as quoted by the vehicle manufacturer.

6.5. CAMSHAFT DRIVE BELT REMOVAL.

- 6.5.1. With the engine set in its timed position, the camshaft drive belt can now be removed.
- 6.5.2. Using an appropriate pulley holding tool such as the Sealey VS754, loosen the inlet and exhaust camshaft adjuster control valves, leave finger tight.
- 6.5.3. **NOTE:** Under no circumstances use the timing tools to counter-hold the camshafts.
- 6.5.4. The exhaust pulley fixing bolt should not be reused.
- 6.5.5. With the engine set and locked in its timed position, slacken the belt tensioner fixing bolt and release the timing belt tensioner using the VSE7400-14 Tensioner Pulley Wrench.
- 6.5.6. Remove the timing belt leaving the pulleys on the camshafts and their fixings finger tight.

6.6. REASSEMBLY

- 6.6.1. Ensure all components are in a serviceable condition and the engine is set and locked into its timed position.
- 6.6.2. Fit the timing belt to the crankshaft sprocket, fit the lower timing belt cover and crankshaft pulley.
- 6.6.3. Using an appropriate counter holding tool such as the Sealey VS754 Counter Holding Tool, tighten the crankshaft pulley bolt to the correct torque and angle following manufacturers data for the individual application.
- 6.6.4. The belt run can now be fitted in the following order, 1. guide pulley, 2. exhaust camshaft, 3. inlet camshaft.
- 6.6.5. The camshaft pulley must be able to turn independently of the camshafts.
- 6.6.6. Tension the belt using the VSE7400-14 Tensioner Pulley Wrench, follow manufacturer's instructions for correct tensioning of the individual application.
- 6.6.7. Check the data recorded previously for camshaft adaptor angles and ensure the camshafts have not moved.
- 6.6.8. Using the Sealey VS754 as a counter hold, tighten the camshaft pulley fixings to the manufacturers specified torque.
- 6.6.9. **NOTE:** this initial tightening is an assembly torque and not the final torque.
- 6.6.9. Every time the angles are checked always zero the inclinometer using the reference bar as previously described. This ensures that any change in the angle of the engine/vehicle is compensated for.
- 6.6.10. The final checks can now be completed, remove all tooling.
- 6.6.11. Turn the crankshaft through 2 complete turns but stopping just before the TDC position.
- 6.6.12. Fit the VSE7400-12 Crankshaft Timing Pin and tighten to 10Nm. (fig.2)
- 6.6.13. Recheck the camshaft angles as previously described in the Checking the Camshaft Timing section. Check the readings against the manufacturer's specification for the individual application.
- 6.6.14. If no adjustment is required, the camshaft pulleys can be tightened to the manufacturer's final settings.
- 6.6.15. If adjustment is required, the following procedure will have to be performed.
- 6.6.16. Position the engine into its timed position as previously described.
- 6.6.17. Fit the VSE7400-12 Crankshaft Timing Pin and tighten to 10Nm. (fig.2)
- 6.6.18. Fit the VSE7400-01 Adaptor/Clamping Plate as previously assembled ensuring the correct adaptors are used, and that the inlet and exhaust adaptors are aligned to their respective camshafts and fully engaged in the camshafts. (fig.5)
- 6.6.19. Using the Sealey VS754 Pulley Holding Tool as a counter hold, loosen both camshaft adjuster control valves and leave finger tight.
- 6.6.20. Place the VSE7400-15 Inclinometer on a flat surface and switch it on, allow the reading to stabilise.
- 6.6.21. Place the inclinometer upside down on the inclinometer reference bar. (fig.4)
- 6.6.22. Press ZERO to set the inclinometer to 00.0.
- 6.6.23. Place the inclinometer the correct way up onto the flat area on the inlet adaptor.
- 6.6.24. Insert a 5mm hex key into the end of the inlet camshaft adaptor and while holding the hex key, slacken the clamping bolt on the VSE7400-01 Adaptor/Clamping Plate.
- 6.6.25. Adjust the position of the camshaft using the hex key until zero (00.0°) is shown on the inclinometer and then lock the adaptor with the 3mm hex bolt.
- 6.6.26. Repeat this procedure for the exhaust camshaft.
- 6.6.27. Once both of the camshafts are set to zero and locked, tighten the camshaft pulley fixing bolts to 20Nm using the Sealey VS754 as a counter hold.
- 6.6.28. Re-check that both camshafts are still reading Zero, if not the process will need to be repeated until they are correct.
- 6.6.29. Remove all tooling.
- 6.6.30. Turn the crankshaft through 2 complete turns but stopping just before the TDC position.
- 6.6.31. Fit the VSE7400-12 Crankshaft Timing Pin and tighten to 10Nm. (fig.2)
- 6.6.32. Recheck the camshaft angles for the specification for the individual application.

6.7. CORRECTION ANGLES

- 6.7.1. Due to forces and subsequent deviation caused by the valve springs against the camshafts, it may be required to adjust the camshafts to corrected angles. The following procedure describes how to adjust to the correction angles.
- 6.7.2. Slacken the clamping bolts on the VSE7400-01 and remove the VSE7400-12 Crankshaft Locking Pin.
- 6.7.3. Rotate the crankshaft 2 complete revolutions stopping just before the TDC position, reinstall the Crankshaft Locking Pin. Rotate the crankshaft until it stops against the Crankshaft Locking Pin.
- 6.7.4. Recheck the camshaft angles as previously described in the Checking Timing section and record the values. These values will be used

to calculate the correction angle.

6.7.5. This is achieved by using the following equation;

Specified angle – current angle = the correction angle.

An example of this is given here for the inlet camshaft, repeat for the exhaust camshaft.

NOTE: THIS EXAMPLE IS PURELY FOR DEMONSTRATION PURPOSES ONLY.

Engine code DADA is a 1.5 TSi engine.

Specified Inlet timing angle $-0.3^{\circ} \pm 1.2^{\circ}$

Specified Exhaust timing angle $+1.1^{\circ} \pm 1.2^{\circ}$

Current inlet camshaft timing measured angle = -0.9°

Specified angle (-0.3°) - Current Angle (-0.9°) = Inlet Correction Timing Angle $(+0.6^{\circ})$

6.8. FINAL CHECKS AFTER CORRECTION

- 6.8.1. Remove all tooling.
- 6.8.2. Turn the crankshaft through 2 complete turns but stopping just before the TDC position.
- 6.8.3. Fit the VSE7400-12 Crankshaft Timing Pin and tighten to 10Nm. (fig.2)
- 6.8.4. Recheck the camshaft angles as previously described in the Checking the Camshaft Timing section. Check the readings against the manufacturers specification for the individual application.
- 6.8.5. If no adjustment is required, the camshaft pulleys can be tightened to the manufacturer's final settings.
- 6.8.6. Reassemble in reverse order of disassembly

7. MAINTENANCE

- 7.1. Clean all used components using soft, dry cloth after use and before storing.
- 7.2. Replace components to the relevant compartment (see fig.1).
- 7.3. Store in a safe, clean and dry environment.



ENVIRONMENT PROTECTION

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment. When the product becomes completely unserviceable and requires disposal, drain any fluids (if applicable) into approved containers and dispose of the product and fluids according to local regulations.

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. Please note that other versions of this product are available. If you require documentation for alternative versions, please email or call our technical team on technical@sealey.co.uk or 01284 757505.

Important: No Liability is accepted for incorrect use of this product.

Warranty: Guarantee is 12 months from purchase date, proof of which is required for any claim.



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