



TIMING TOOL KIT FOR JLR 2.0/2.0D INGENIUM ENGINE - CHAIN DRIVE

MODEL NO: **VSE3037**

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.
- ✗ **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.
- ✓ 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.
- ▲ **IMPORTANT!** These Instructions are provided as a guide only. Always refer to the vehicle manufactures' 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.

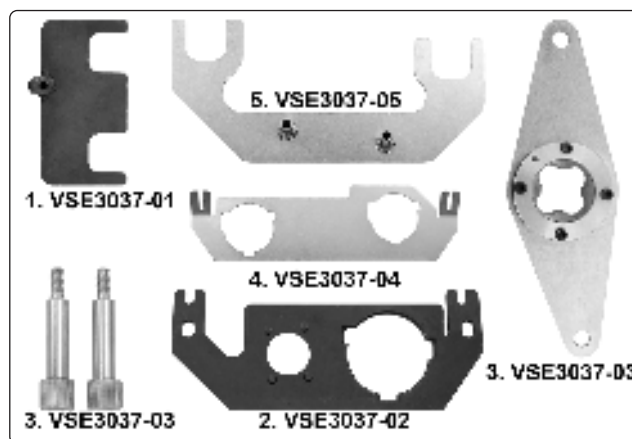
2. INTRODUCTION

Suitable for the new 2.0 Ingenium chain drive petrol and diesel engines from JLR.

Contains all the essential tools required to lock the engines into their timed position. Includes the special tools required to set the camshaft adjusters. Supplied in a storage case with instructions and a warning tag.

3. CONTENTS

Item	Part no.	Description	OE Tool
1	VSE3037-01	Camshaft Locking Tool	303-1625
2	VSE3037-02	Camshaft Adjuster Locking tool	303-1631
3	VSE3037-03	Crankshaft Pulley Alignment Tool	303-1630
4	VSE3037-04	Camshaft adjuster Locking tool	303-1636
5	VSE3037-05	Camshaft Locking Tool	303-1635
Associated Tool(s):		VSE3039	



4. APPLICATIONS

MAKE	MODEL
Jaguar	F-Pace (17-24), F-Type Coupe (17-20), F-Type Convertible (17-21), XE (15-24), XF (15-24)
Land Rover	Defender (19-25), (Discovery L462 (17-20), Discovery Sport L550 (15-25), Evoque L538 (15-25), Range Rover Sport L494 (16-21), Velar L560 (17-25)

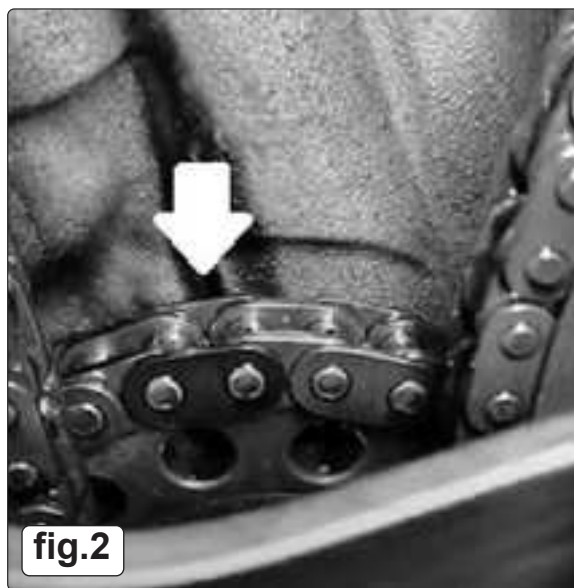
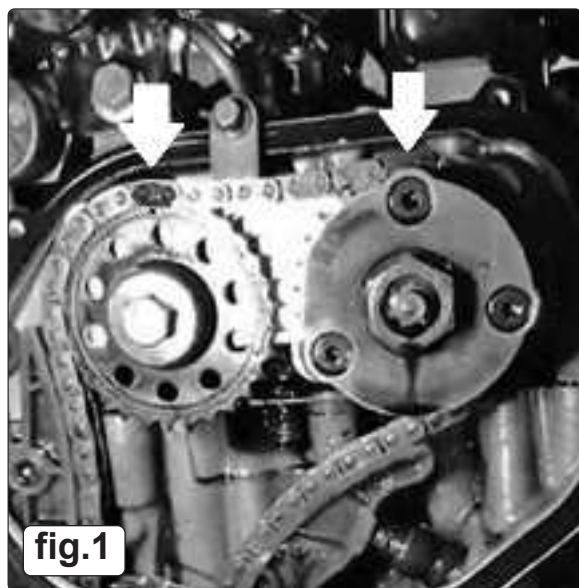
ENGINE CODES	
2.0D:	AJ200D AJ-200D 204DT 204DTA 204DTD 204DTY
2.0:	AJ200P AJ-200P PT204

5. INSTRUCTIONS

5.1. Diesel Engines - Removal

Note: The timing chain is at the rear of the engine, therefore removal/installation of timing chain(s) will require transmission removal.

- 5.1.1. Turn crankshaft until the plated (or coloured) timing chain links are aligned with the timing marks as follows.
Camshafts (fig.1)
Idler primary sprocket (fig.2)
H.P fuel pump (fig.3)
- 5.1.2. Install the VSE3037-03 Crankshaft Pulley Alignment Tool without the pins 6.
- 5.1.3. Using crankshaft pulley alignment tool, rotate the crankshaft slowly clockwise until the VSE3037-01 Camshaft Locking Tool can be fitted 7.
- 5.1.4. Using the Crankshaft Pulley Alignment Tool, turn the crankshaft anti-clockwise until the pins locate in datum holes (fig.4)
- 5.1.5. Install the VSE3037-02 Camshaft Adjuster Locking Tool 8.
- 5.1.6. Slacken the camshaft adjuster control valve but **DO NOT** remove it.
- 5.1.7. Remove the VSE3037-02 Camshaft Adjuster Locking Tool.
- 5.1.8. Remove the secondary timing chain tensioner.
- 5.1.9. Remove the secondary timing chain tensioner rail.
- 5.1.10. Remove the camshaft adjuster assembly.

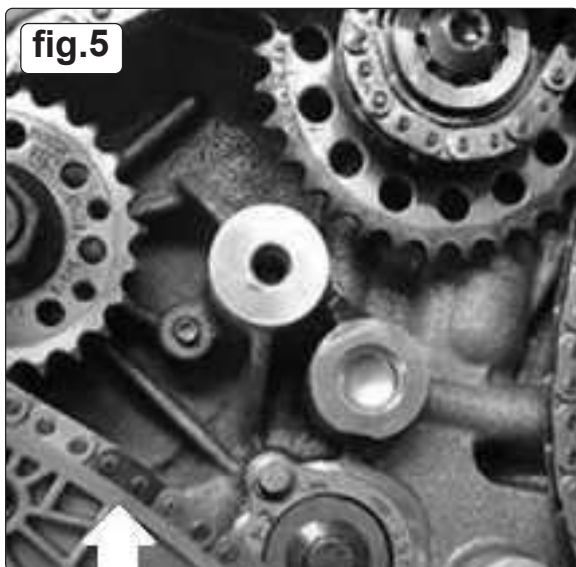
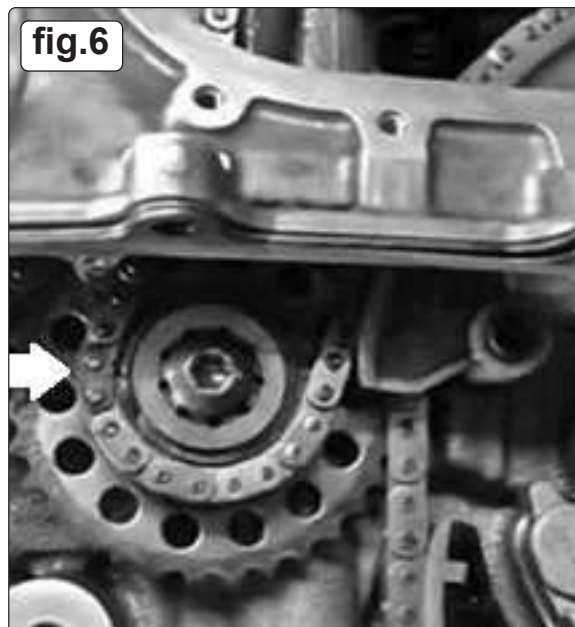


- 5.1.11. Remove the secondary timing chain guide.
- 5.1.12. Remove the secondary timing chain.
- 5.1.13. Remove the primary timing chain tensioner.
- 5.1.14. Remove the primary timing chain lower guide and tensioner rail.
- 5.1.15. Slacken the idler sprocket bolt and remove the idler sprocket.
- 5.1.16. Remove primary timing chain upper guide and the primary timing chain.

5.2. Diesel Engines - Installation

- 5.2.1. Ensure the VSE3037-03 Crankshaft Pulley Alignment Tool and VSE3037-01 Camshaft Locking Tool are correctly fitted.
- 5.2.2. Ensure the timing mark on high-pressure fuel pump sprocket is aligned with the timing mark on cylinder block.
- 5.2.3. Fit the primary timing chain.
- 5.2.4. Ensure the plated (or coloured) timing chain link is aligned with timing mark on the high-pressure fuel pump sprocket. (fig.3)
- 5.2.5. Ensure the plated (or coloured) timing chain link is aligned with timing mark on the chain guide. (fig.5)
- 5.2.6. Fit the new primary timing chain lower guide.
- 5.2.7. Fit the new primary timing chain upper guide.
- 5.2.8. Fit the chain idler sprocket and tighten the bolt 14 to 35 Nm.
- 5.2.9. Ensure the plated (or coloured) timing chain link is aligned with timing mark on idler sprocket. (fig.2)
- 5.2.10. Fit the new primary timing chain tensioner rail and timing chain tensioner.





- 5.2.11. Remove the primary timing chain tensioner locking tool and ensure the tensioner fully releases and tensions the timing chain.
- 5.2.12. Fit the secondary timing chain ensuring the plated (or coloured) timing chain link is aligned with the timing mark on the idler sprocket (fig.6)
- 5.2.13. Ensure the plated (or coloured) timing chain link is aligned with the timing mark on the camshaft sprocket (fig.1).
- 5.2.14. Fit the new secondary timing chain guide.
- 5.2.15. Fit the new camshaft adjuster control valve, tighten to finger tight only.
- 5.2.16. Ensure the plated (or coloured) timing chain link is aligned with the timing mark on the camshaft adjuster. (fig.7)
- 5.2.17. Fit the new secondary timing chain tensioner rail.
- 5.2.18. Fit the new secondary timing chain tensioner.
- 5.2.19. Remove the secondary timing chain tensioner plunger retaining clip and ensure the tensioner plunger releases fully to tension the timing chain.
- 5.2.20. Fit the VSE3037-02 Camshaft Adjuster Locking Tool.
- 5.2.21. Tighten the camshaft adjuster control valve to 10 Nm, slacken by 90° and then tighten to 25 Nm + 40 °.
- 5.2.22. Remove all timing tools.

5.3. Petrol Engines - Removal

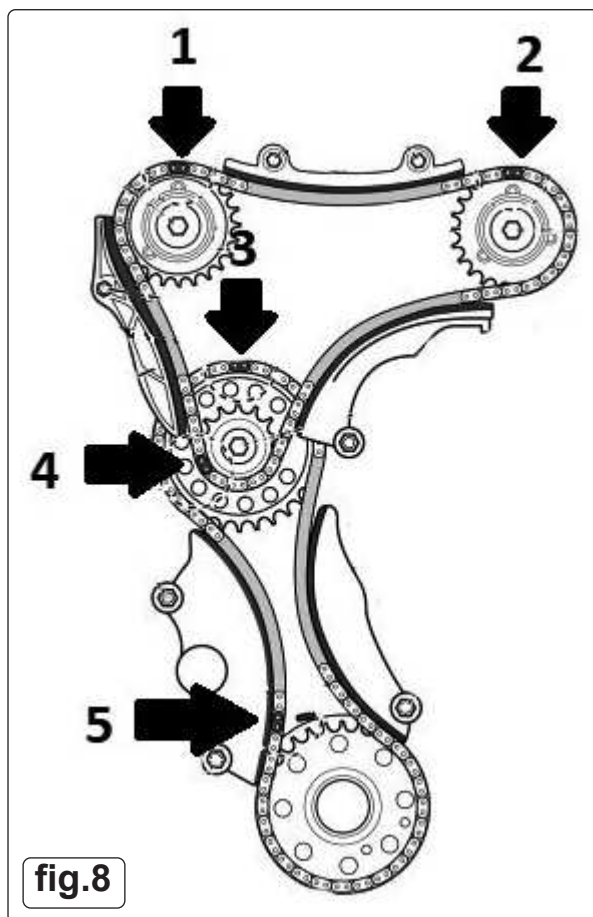
Notes: The timing chain is at the rear of the engine, therefore removal/installation of timing chain(s) will require transmission removal. The camshaft adjuster control valves **MUST** only be used three times. Stamp bolt heads with centre punch to indicate usage.

- 5.3.1. Fit the VSE3037-03 Crankshaft Pulley Alignment Tool without the pins.
- 5.3.2. Turn crankshaft clockwise until timing marks positioned as shown 1,2,3,4 & 5. (fig.8)
- 5.3.3. Fit the VSE3037-05 Camshaft Locking Tool.
- 5.3.4. Fit the VSE3037-04 Camshaft Adjuster Locking Tool.
- 5.3.5. Fit the crankshaft pulley alignment tool locking pins.
- 5.3.6. Slacken the camshaft adjuster control valves.
- 5.3.7. Remove the secondary timing chain tensioner.
- 5.3.8. Remove the camshaft adjuster locking tool.
- 5.3.9. Remove the camshaft adjuster control valves.
- 5.3.10. Remove the camshaft adjusters.

- 5.3.11. Remove the secondary timing chain guides, tensioner rail and secondary timing chain.
- 5.3.12. Remove the primary timing chain guide bolt and timing chain tensioner.
- 5.3.13. Remove the primary timing chain guides and tensioner rail.
- 5.3.14. Slacken the idler sprocket bolt and remove the idler and primary timing chain.

5.4. Petrol Engines - Installation

- 5.4.1. Make sure the VSE3037-03 Crankshaft Pulley Alignment Tool and locking pins are correctly fitted.
- 5.4.2. Ensure the VSE3037-05 Camshaft Locking Tool is correctly fitted to camshafts.
- 5.4.3. Fit primary timing chain to idler sprocket. (fig.8.3)
- 5.4.4. Ensure the plated (or coloured) timing chain link is aligned with the timing mark on the idler sprocket. (fig.8.3)
- 5.4.5. Fit the primary timing chain and idler sprocket as an assembly.
- 5.4.6. Ensure the plated (or coloured) timing chain link is aligned with timing mark on the chain guide and with the timing mark on the cylinder block. (fig.8.5)
- 5.4.7. Tighten the idler sprocket bolt to 35 Nm.
- 5.4.8. Fit new primary timing chain lower guide ensuring the timing marks are aligned (fig.8.3 - 8.5)
- 5.4.9. Fit new primary timing chain tensioner rail.
- 5.4.10. Lock the primary timing chain tensioner in its retracted position.
- 5.4.11. Disengage the tensioner plunger retaining and push the plunger into tensioner housing.
- 5.4.12. Release tensioner plunger retaining clip.
- 5.4.13. Fit the primary timing chain tensioner.
- 5.4.14. Release the primary timing chain tensioner plunger retaining clip.
- 5.4.15. Fit the secondary timing chain.
- 5.4.16. Ensure the plated (or coloured) timing chain link is aligned with the timing mark on the idler sprocket (fig.8.4).
- 5.4.17. Fit the new secondary timing chain guide.
- 5.4.18. Fit the inlet camshaft adjuster.
- 5.4.19. Ensure the plated (or coloured) timing chain link is aligned with the timing mark on the camshaft adjuster (fig.8.1)
- 5.4.20. Fit the inlet camshaft adjuster control valve. Tighten the inlet camshaft adjuster control valve to 10 Nm, slacken the inlet camshaft adjuster control valve by 90°.
- 5.4.21. Fit new secondary timing chain tensioner rail.
- 5.4.22. Fit the exhaust camshaft adjuster.
- 5.4.23. Ensure the plated (or coloured) timing chain link is aligned with timing mark on camshaft adjuster (fig.8.2)
- 5.4.24. Fit the exhaust camshaft adjuster control valve and tighten to 10 Nm, slacken the exhaust camshaft adjuster control valve by 90°.
- 5.4.25. Fit new secondary timing chain guide.
- 5.4.26. Fit the VSE3037-05 Camshaft Locking Tool.
- 5.4.27. Lock the secondary timing chain tensioner into its retracted position and remove the tensioner plunger retaining clip
- 5.4.28. Fit the secondary timing chain tensioner and tighten to 55 Nm.
- 5.4.29. Release the timing chain tensioner and ensure it tensions the timing chain.
- 5.4.30. Tighten the camshaft adjuster control valves to 25 Nm + 60°.
- 5.4.31. Remove all timing tools.



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.



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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 is required for any claim.

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