

## Laser 4419

# Laser 4419 Engine Timing Tool Set

## INSTRUCTION MANUAL FOR BMW 1.8/2.0 ENGINES

### 1. Introduction and Overview

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The Laser 4419 Engine Timing Tool Set is designed for precise engine timing adjustments on specific BMW petrol engines. This kit is essential for maintaining correct valve timing when performing engine repairs such as cylinder head removal, camshaft replacement, or timing chain service.

This tool set is compatible with BMW 1.6, 1.8, and 2.0 petrol engines, specifically N42 and N46 engine codes. Applicable vehicle models include:

- 118i/120i (E87)
- 318i/320i (E90)
- Z4 2.0 (E85)
- 316i/316ti Compact (E46)
- 318i/318ti Compact (E46)
- X3 (2001-2010)

The tools are specifically engineered for engines equipped with chain-driven camshafts, ensuring accurate alignment during critical engine procedures.

### 2. Safety Information

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Always prioritize safety when working on automotive engines. Failure to follow safety precautions can result in serious injury or damage to the vehicle.

- **Wear appropriate personal protective equipment:** This includes safety glasses, gloves, and suitable work attire.
- **Consult vehicle service manual:** Always refer to the specific vehicle manufacturer's repair manual for detailed, model-specific instructions and torque specifications. This instruction manual provides general guidance for the tool set's use.
- **Ensure engine is cool:** Allow the engine to cool completely before beginning any work to prevent burns.
- **Disconnect battery:** Disconnect the vehicle's battery to prevent accidental starting or electrical shorts.
- **Work in a well-ventilated area:** Ensure adequate ventilation, especially if using cleaning solvents or other chemicals.

- **Secure the vehicle:** Use jack stands to support the vehicle securely if lifting is required. Never rely solely on a jack.
- **Keep tools clean and organized:** Prevent accidents by keeping your workspace tidy and tools properly stored.
- **Professional use recommended:** This tool set is intended for use by qualified technicians with experience in engine repair. If you are unsure about any procedure, seek professional assistance.

### 3. Package Contents

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The Laser 4419 Engine Timing Tool Set includes the following components, typically supplied in a protective storage case:

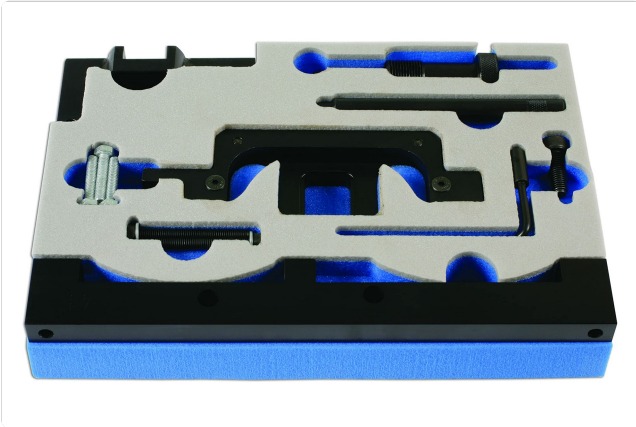


Image: The complete Laser 4419 Engine Timing Tool Set neatly organized within its custom-fit foam storage case.

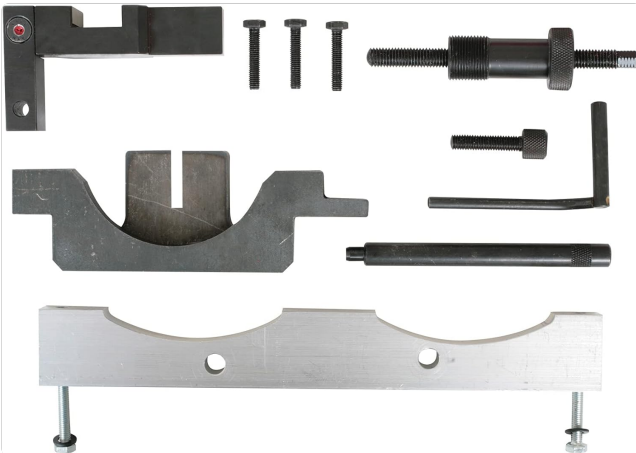


Image: All individual components of the Laser 4419 Engine Timing Tool Set, including various locking pins, camshaft alignment tools, and tensioner tools, laid out for inspection.

- Camshaft Locking Tool (Inlet)
- Camshaft Locking Tool (Exhaust)
- Crankshaft Locking Pin
- Flywheel Locking Pin
- Tensioner Locking Pin
- Vanity Unit Alignment Tool
- Associated fasteners and adapters

Inspect all components upon receipt to ensure they are present and undamaged. Contact your supplier immediately if any parts are missing or faulty.

## 4. Setup

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Proper setup is crucial for accurate engine timing. This section provides general steps; always refer to the specific BMW service manual for your vehicle model for precise instructions.

1. **Prepare the vehicle:** Park the vehicle on a level surface, engage the parking brake, and disconnect the battery.
2. **Access the engine:** Remove any components necessary to gain access to the timing chain, camshafts, crankshaft, and associated timing marks. This may include engine covers, intake manifold, or other accessories.
3. **Rotate engine to Top Dead Center (TDC):** Carefully rotate the crankshaft manually in the normal direction of rotation until the engine is at Top Dead Center (TDC) for cylinder 1 on the compression stroke. Verify this using the crankshaft locking pin and camshaft alignment marks as specified in the vehicle's service manual.
4. **Clean components:** Ensure all timing components, including camshafts, crankshaft, and timing chain, are clean and free from oil or debris before installing the timing tools.

## 5. Operating Instructions

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The Laser 4419 tool set is designed to lock the engine's critical timing components in their correct positions, facilitating accurate timing chain replacement or other related repairs. Follow these general operating steps in conjunction with your vehicle's specific service manual.

1. **Install Crankshaft Locking Pin:** Once the engine is at TDC, insert the crankshaft locking pin into its designated hole in the engine block to secure the crankshaft in position. Ensure it is fully seated and locked.
2. **Install Camshaft Locking Tools:** Position the camshaft locking tools onto the inlet and exhaust camshafts. These tools typically fit into specific slots or flats on the camshafts, ensuring they are correctly aligned. Secure them with any provided fasteners.
3. **Install Flywheel Locking Pin (if applicable):** Some applications may require a flywheel locking pin to further secure the engine's rotational position. Refer to your service manual.
4. **Perform timing chain/component service:** With the engine components securely locked, proceed with the necessary repairs, such as replacing the timing chain, sprockets, or tensioners.
5. **Check timing tension:** After installing new components, ensure the timing chain tensioner is correctly installed and tensioned according to manufacturer specifications.
6. **Remove timing tools:** Once all timing-related work is complete and verified, carefully remove all timing tools in the reverse order of installation.
7. **Rotate engine manually:** Before starting the engine, manually rotate the crankshaft two full revolutions to ensure there is no interference and that all timing marks align correctly. Re-check timing if necessary.
8. **Reassemble engine:** Reinstall all removed engine components, ensuring all fasteners are torqued to manufacturer specifications.

## 6. Maintenance

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Proper maintenance of your Laser 4419 Engine Timing Tool Set will ensure its longevity and accuracy.

- **Cleaning:** After each use, clean all tools thoroughly to remove oil, grease, and debris. Use a suitable degreaser if necessary, then wipe dry.
- **Inspection:** Regularly inspect tools for any signs of wear, damage, or deformation. Do not use damaged tools, as this can compromise accuracy and safety. Replace any worn or damaged components immediately.
- **Lubrication:** Apply a light coat of rust-preventative oil to metal components before storage, especially if storing for extended periods in humid environments.

- **Storage:** Store the tool set in its original protective case in a dry, clean environment to prevent corrosion and damage.

## 7. Troubleshooting

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If you encounter issues during the timing procedure, consider the following troubleshooting steps:

- **Tools not fitting:** Double-check that you are using the correct tool set for your specific engine code (N42/N46) and vehicle model. Ensure the engine is at the correct TDC position as per the service manual.
- **Engine not starting or running poorly after timing:** This indicates incorrect timing. Immediately stop the engine and re-verify all timing marks and tool installations. Consult the vehicle service manual for diagnostic procedures.
- **Damaged tools:** If a tool appears damaged or bent, do not attempt to use it. Using compromised tools can lead to inaccurate timing, engine damage, or personal injury. Obtain a replacement.
- **Uncertainty:** If you are unsure about any step or encounter persistent issues, it is highly recommended to consult a professional automotive technician.

## 8. Specifications

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Specification	Detail
Model Number	4419
Manufacturer Part Number	LAS4419
Compatible Engine Codes	BMW N42, N46 (1.6, 1.8, 2.0 Petrol)
Product Dimensions (Case)	Approximately 5.4 x 19.6 x 29.3 cm
Item Weight	Approximately 500 g
Manufacturer	The Tool Connection Ltd.
Country of Origin	United Kingdom (Made in Sheffield)

## 9. Warranty and Support

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For warranty information, please refer to the documentation provided at the time of purchase or contact your retailer. Warranty terms typically cover manufacturing defects but do not cover damage due to misuse, improper maintenance, or normal wear and tear.

For technical support or inquiries regarding the Laser 4419 Engine Timing Tool Set, please contact the manufacturer, The Tool Connection Ltd., or your authorized distributor. Ensure you have your product model number (4419) and purchase details available when seeking support.