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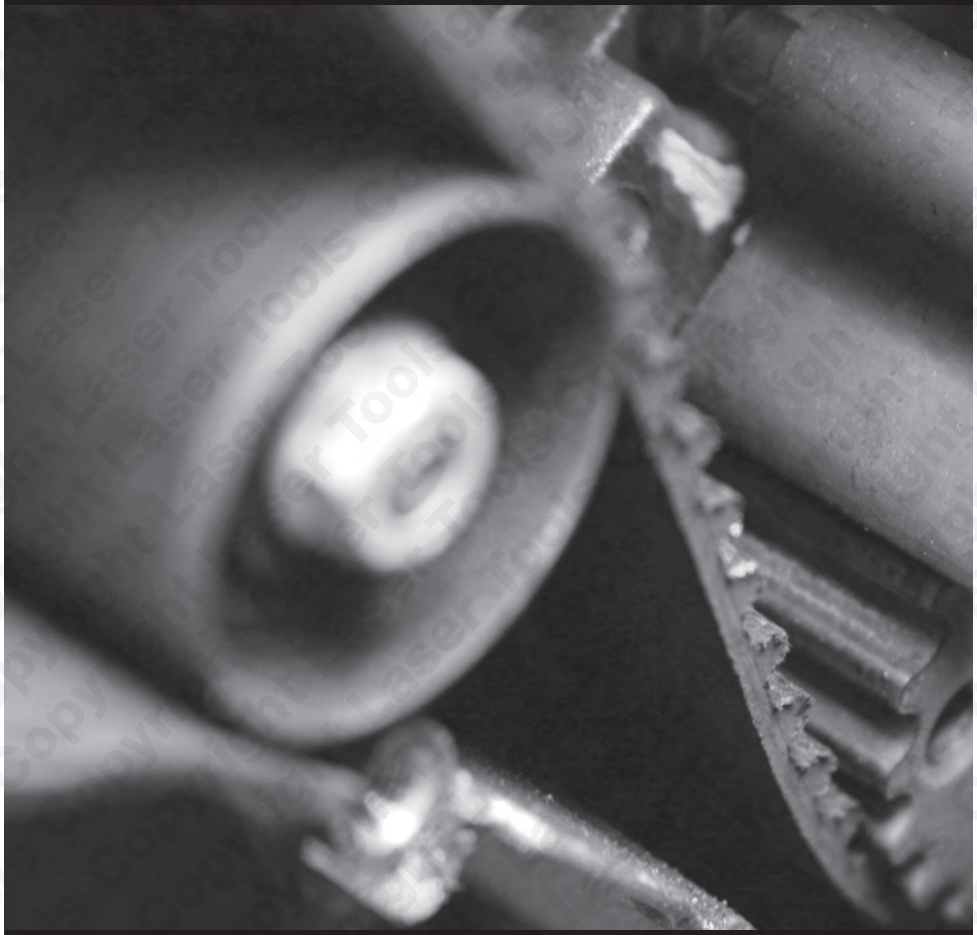
4771

# LASER®

# Engine Timing Tool Set

## Volkswagen 2.5/4.9D/TDI PD



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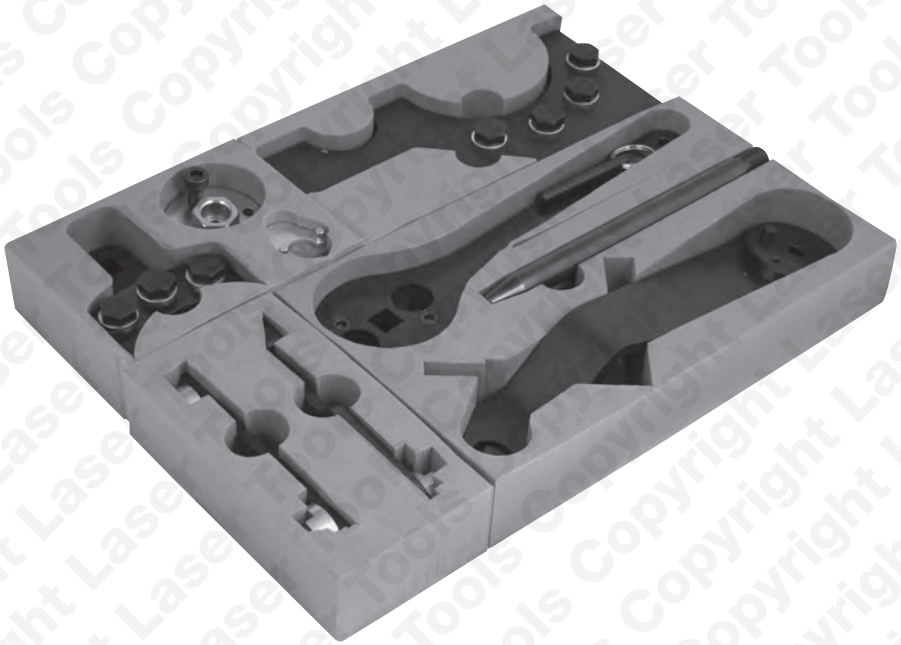
# Introduction



**4771**
**Engine Timing Tool Kit**
**Volkswagen 2.5/4.9D/TDI PD**

Volkswagen Touareg and Transporter 2.5 TDI PD models with engine code: BAC, BLK, BPD, AXD, AXE, BLJ, BNZ, BPC (05-09) plus 4.9D/TDI PD models with engine code: AYH, BKW, BLE, BWF (03-09)

A new timing tool kit designed for gear driven engines where the injection timing is controlled by the camshaft followers.

This engine is driven by Timing Gears which are more commonly fitted to engines without an overhead Camshaft or on diesel engines. Most gears used for driving camshafts and diesel injection pumps have helical-cut teeth but some applicatons have spur gears with straight cut or backlash reduction systems.

The service life of the timing gears depends on:
Correct gear backlash | Correct lubrication Timing gears are not normally considered part of the general service and need checking only if they are dismantled or become noisy.



# Safety Precautions – Please Read

- Disconnect the battery earth leads (check radio code is available)
- Remove spark or glow plugs to make the engine turn easier
- Do not use cleaning fluids on belts, sprockets or rollers
- Always make a note of the route of the auxiliary drive belt before removal
- Turn the engine in the normal direction (clockwise unless stated otherwise)
- Do not turn the camshaft, crankshaft or diesel injection pump once the timing chain/belt has been removed (unless specifically stated)
- Do not use the timing chain/belt to lock the engine when slackening or tightening crankshaft pulley bolts
- Mark the direction of the chain/belt before removing
- It is always recommended to turn the engine slowly, by hand and to re-check the camshaft and crankshaft timing positions.
- Crankshafts and Camshafts may only be turned with the chain drive mechanism fully installed.
- Do not turn crankshaft via camshaft or other gears
- Remove spark or glow plugs to make the engine turn easier
- Check the diesel injection pump timing after replacing the chain
- Observe all tightening torques

**ALWAYS REFER TO A REPUTABLE MANUFACTURERS WORKSHOP MANUAL**

# General Information

**This timing tool kit has been specifically compiled to give a comprehensive range of engine timing tools for gear driven engines.**

Always refer to the vehicle manufacturer's service manual or a suitable proprietary instruction book.

The Tool Connection Limited recommend and endorse the use of the Autodata Timing Belts, Chains and Gears instructions and applications books.

Both books are available through your Laser Tools distributor:

Part No 3601
Autodata | **Timing Belts**

Part No 3626
Autodata | **Timing Chains and Gears**

Or for a one off application chapter and instructions on a specific engine go to:

**http://www.autodata-online.com/uk/timingbelt.asp**

## Applications

Our applications data is supplied by Autodata and we are able to supply this data to you in a pdf format.

This application list is enclosed in the attached CD listing which tool is required for each engine code.

If this is a specific kit for a group of engine codes the application list has been supplied showing the main vehicles this kit is designed for and does not list every model each pin fits.

If this is a master kit then all vehicles are included.



## Languages

On the enclosed CD you will also find this document in the following languages:

English
Dutch
French
German
Portuguese
Spanish

## WARNING

**Incorrect or out of phase engine timing can result in damage to the valves.**

**The Tool Connection cannot be held responsible for any damage caused by using these tools in anyway.**



# General Guidance Notes

## Valve Timing

Valve timing is essential to the efficient performance of the Petrol or Diesel engine. The valves are opened and closed by the camshaft(s) which are driven by the cam belt, chain or gears from the crankshaft.

## Crankshaft Locking Tools

- The Crankshaft TDC Location Pin is designed to screw into the cylinder block and to provide a stop for the crankshaft to be positioned against to set the TDC position.
- Turn the engine in the normal direction of rotation until the timing mark on the injection pump sprocket lines up with the cast lug on the timing cover.
- Remove the plug from the cylinder block access hole and screw in the TDC location pin.
- Slowly turn the crankshaft clockwise until the web makes contact with the end of the pin. Number 1 cylinder is now set at TDC on ignition stroke.

## Camshaft Setting/Locking Tools

- Camshaft setting/locking tools are used to accurately align a datum slot, located in the end of the camshaft, with the top face of the camshaft housing to hold the camshaft at the (TDC) Top Dead Centre position.
- Follow the service manual instructions to remove the camshaft cover and timing chain covers.
- Turn engine in the normal direction of rotation until the camshaft setting/locking plate can be inserted into the machined slot in the end of the camshaft.
- When fitting Camshaft setting/locking plates, feeler gauges/shims of equal thickness can be inserted under either side of the plate until all free play has been eliminated. The camshaft is now locked in its timing position and service work can now be carried out.

## Tensioning Tools

The tension of the chain is vitally important and must be set using the tensioner. If an automatic tensioner is fitted it should not be tampered with. Manually tensioned chains must be tensioner to the manufacturer's specification.

For a manual tensioner see:

Cambelts Tension Gauge
**3899**

Tensioning Guage For Cambelts
**4212**

# Special Tools

## Crankshaft Locking Tool

- For 10cyl diesel engine fitted to Volkswagen Touareg (03-)

## Camshaft Gear Retaining Tool

- Two tools for removing and installing the camshaft drive gear and eliminating play in the gear train

## Guide Pins

- For fitting gear train assembly on 10cyl engine

## Crankshaft Turning tool

- For setting the engine to TDC on No.1 cylinder
- Only used on 5cyl 2.5 engine

## Crankshaft Alignment Tool

- Required for 2.5 engine only

## Camshaft Compensation Gear pre-tensioning tool

- Used with a standard 3/8"D torque wrench
- For turning the eccentric bolt when installing the camshaft drive gear

## ALSO REQUIRED:

- Standard 3/8"D Torque Wrench
- M16 Spline bit – for removing and installing the camshaft drive gear securing bolt and rear brake calliper on Volkswagen Touareg only

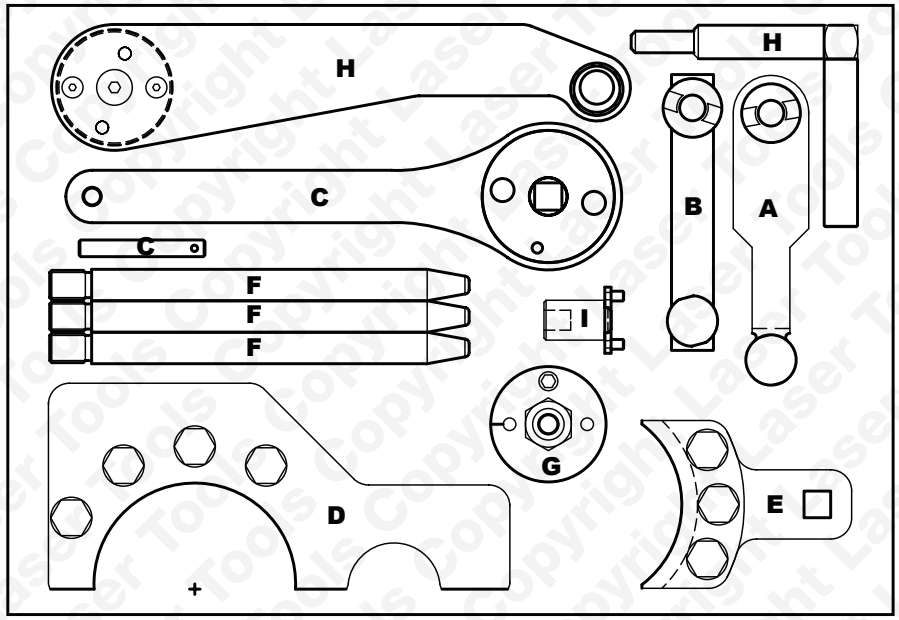
Troque Wrench | 3/8"D 19>110 Nm
**1342**

Troque Wrench | 1/2"D 10>150Ftlb
**0316**

M14 Spline Bit | 1/2"D 100mm Long
**4147**



# Plan Layout




| Component Code | Layout ID | OEM Ref | Description |
|---|---|---|---|
| A | C422 | T10193 | Camshaft Locking Tool Type 1 |
| B | C423 | T10194 | Camshaft Locking Tool Type 2 |
| C | C424 | T10195 | Crankshaft Locking Tool |
| D | C425 | T10199 | Camshaft Gear Retaining Tool Type 1 |
| E | C426 | T10199/1 | Camshaft Gear Retaining Tool Type 2 |
| F | C427 | T10200 | Guide Pin Set |
| G | C428 | T10225 | Crankshaft Turning Tool |
| H | C429 | T10226 | Crankshaft Alignment Tool |
| I | C430 | T10234 | Camshaft Compensation Gear Pre-tensioning tool |