

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



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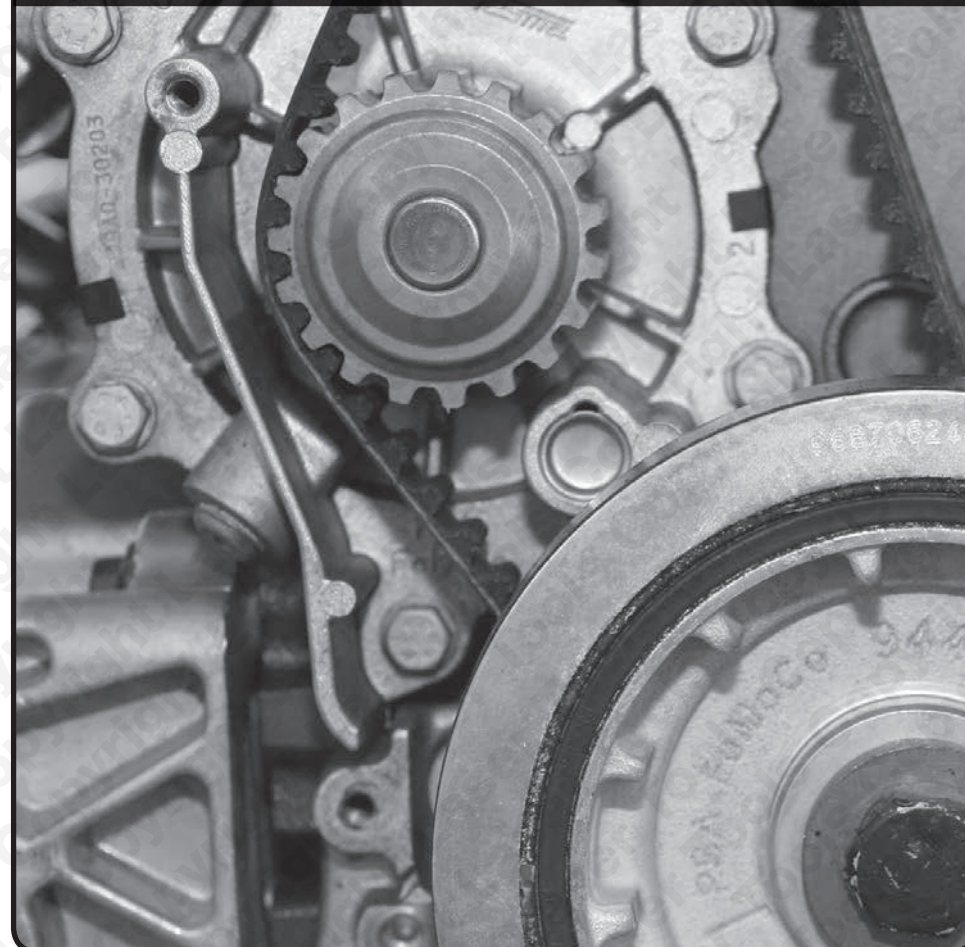
Guarantee

If this product fails through faulty materials or workmanship, contact our service department direct on: **+44 (0) 1926 818186**. Normal wear & tear are excluded as are consumable items & abuse.

LASER[®]

Part No. 4864

Master Engine Timing Tool Set | 2009 Volkswagen Audi Group



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Introduction



4864
Master Engine Timing Tool Set | 2009
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including: the latest FSi/TFSi engines.

Special Tool

Special Tools

Crankshaft Locking Tool

C395 Crankshaft Pulley Bolt Adaptor

This tool is required to enable the crankshaft to be turned on most Audi chain driven FSi engines plus 2.7/3.0 TDi engines fitted to A4/A6 Quattro and Q7.

C345 Camshaft Locking Tools

Designed to correctly align the camshafts to achieve the correct valve timing position. It is important to fit the tool correctly, and where applicable the orientation is marked on the tool.

If the tools cannot be correctly fitted the valve timing is incorrect and the tension must be released and the correct alignment procedure then followed.

C356 Camshaft Alignment Tool

Tool F is fitted between the slots located between each cam lobe. This tool is secured in position as arrowed, using 2 x M6 Bolts provided. The correct camshaft position can only be achieved following the removal of tension to the chain.

C357 Crankshaft Locking Tool

Crankshaft Locking Tool a choice must be correctly made from two to set the crankshaft timing position during both removal and replacement of the timing belt. These tools are not interchangeable.

The crankshaft is first turned to TDC on No1 cylinder, checking the timing marks on the camshaft sprocket hubs are aligned.

Slide the correct tool into position ensuring that the triangular mark/ arrow on the tool aligns with the timing mark on the crankshaft sprocket.

Plan Layout

Ref	Code	OEM Code	Description
M	C226	T10170	DTi Adaptor
N	C157	T10050	Crankshaft Sprocket Alignment Tool
O	C304	T10100	Crankshaft Sprocket Alignment Tool
P	C158		HT Setcrew M5 x 60
Q	C159		M5 x 55 Stud and Nuts
R	C284	T20046	Camshaft Tensioner Pin
S	C161	3369	Support Guide
T	C335	T10252	Camshaft Alignment Tool
U	C348	3366	Chain Tensioner Retainer
V	C337	T10092	Chain Tensioner Retainer
W	C282	T10115	Tensioner Pin
X	C395	T40058	Crankshaft Pulley Bolt Adaptor
Y	C283	T10060/A	Tensioner Pin
Z	C162	T20038/3418	Camshaft Alignment/Locking Tool

General Information

This master timing tool kit has been specifically compiled to give a comprehensive range of engine timing locking tools for Cam belts, chains and gears.

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.

The data is the copyright of The Tool Connection and should not be reproduced.

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.

- 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.

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.

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:

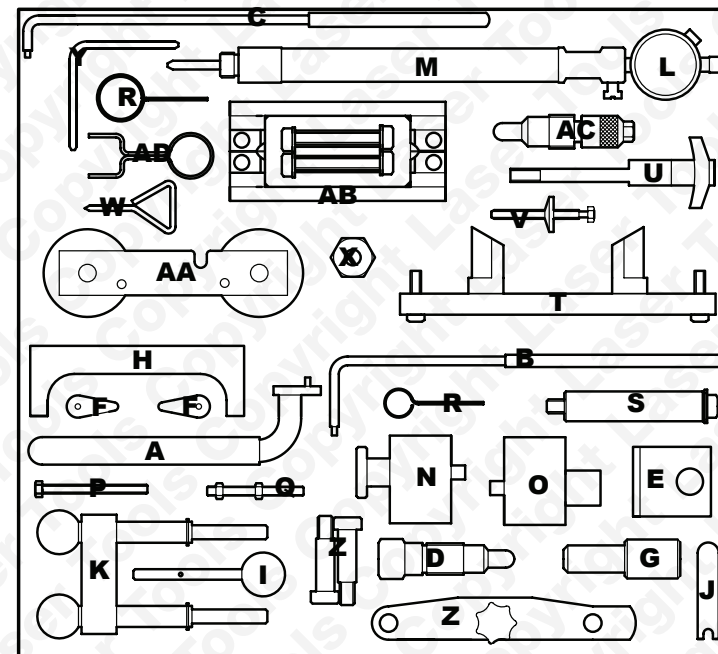
Cambelts Tension Gauge
3899



Tensioning Gauge For Cambelts
4212



Plan Layout



Ref	Code	OEM Code	Description
A	C203	Matra V159	Tension Wrench
B	C204	U30009/3387/T10004	Tension Wrench
C	C441	T10020	Tension Wrench
D	C043	3242 I T40237	Crankshaft Locking Pin
E	C044	3458	Camshaft Alignment Plates
F	C059		Shim Set
G	C061	U20003/2064	Injection Pump Timing Pin 15,4 mm. Dia.
H	C070	U40021/2065A	Camshaft Setting Bracket
I	C216	T20102/3359	Injection Pump Timing Pin 6 mm. Dia.
J	C095	T10008	Tensioner Setting Tool
K	C096	T10016/T10074	Camshaft Alignment/Locking Tool
L	C127	VAS 6079	Dial Test Indicator