



MANUAL

94313390

SAFETY NOTICE

To understand the functioning of the tools, it is necessary to read the manual first!

- > Read these instructions before assembling, during installation and throughout use and in the proper sequence
- > Always refer to the OEM manufacturer's instructions and service manuals for the latest data and to maintain the correct sequence
- > These work instructions and the recommended tools are meant to serve as aides only and are by no means a guarantee for certain results.
- > This tool kit is a special collection and it has been tested and used successfully on several occasions. It is of the utmost importance to maintain the correct procedure as per the instructions
- > The use of the tools should only be carried out by qualified personnel!



ATTENTION
Special caution



CORRECT



LIGHT BULB
Hint or recommendation



WRONG



SAFETY GOGGLES
Wearing safety goggles
necessary





Nr.	Description	PART.-Nr.
1	Crankshaft Pulley Holding Tool	303-1310, 303-1177, 2.000.018.3400, 2.000.001.000
2	Camshaft Setting Pin Set	6mm Drill, 0198.B2, 2.000.016.500, LDV167
3	Crankshaft Setting Tool	303-1587, 0198.N, 2.000.018.700
4	Chain Tensioner Locking Pin	0198.J
5	Oil Pump Alignment Tool	303-705
6	Flywheel Locking Tool	303-254
7	Timing Chain Cover Aligner	303-682, LDV177
8	Crankshaft Seal Installer	303-679A, LDV170



ADDITIONAL TOOLS REQUIRED:

Crankshaft Pulley Hold Tool Handle

INTRODUCTION

Petrol Engine Setting / Locking Tool Kit covers timing chain removal and installation procedures on all variants of the 2.0/2.2/2.4L four cylinder and 3.2L five cylinder TDCi/TDdi DuraTorq 'PUMA' engines installed in a number of models 2000-2018. Engines with camshaft driven H.P. fuel pumps utilise the same setting tools as engines with chain driven pumps, but the pump timing pin is not required as the pump is directly connected to the camshaft.



CRANKSHAFT PULLEY REMOVAL

Using Crankshaft Pulley Holding Tool (1) in conjunction with Crankshaft Pulley Hold Tool Handle, rotate the crankshaft pulley to position.

Remove the crankshaft pulley. Crankshaft Pulley Holding Tool (1) is also used to counter hold the crankshaft pulley when tightening the retaining bolts the final torque figure.



CRANKSHAFT SEAL REMOVAL

Assemble Timing Chain Cover Aligner (7) to Crankshaft Seal Installer (8).

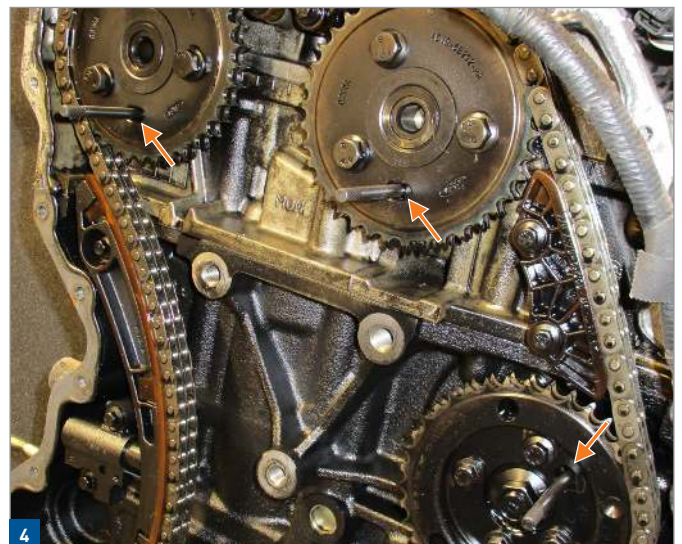
Locate tool assembly into holes of crankshaft seal.

Rotate crankshaft seal in anti-clockwise direction to remove it from the timing chain cover. Remove retaining screws and remove cover.



CRANKSHAFT TIMING

Install crankshaft setting tool (3) on the nose of the crankshaft, ensuring that the location peg is positioned in the recess of the crankshaft. Secure the tool in position using one of the crankshaft pulley bolts and a timing chain cover retaining screw.



CAMSHAFT/H.P. PUMP SETTING PINS

Ensure that the holes in the camshaft sprockets and H.P. pump sprocket are aligned with the holes in the engine.

Install camshaft setting pins through holes in camshaft sprockets and through the hole in the H.P. fuel pump sprocket. For engines with H.P. fuel pumps that are driven directly from the rear of the camshaft, only use two setting pins through the camshafts.

TENSIONER LOCKING PIN

Compress the plunger of the timing chain tensioner, retain in position using Chain Tensioner Locking Pin ④. Remove the camshaft timing chain guide rails and the timing chain.



ATTENTION

Removal of the timing chain requires removal of crankshaft setting tool ③. Ensure that the crankshaft is positioned correctly, with ③ fitted to the crankshaft and retained using a timing chain cover screw, before installing the timing chain on to the sprockets.

TIMING CHAIN COVER ALIGNMENT + CRANKSHAFT SEAL INSTALLATION



Locate Timing Chain Cover Aligner ⑦ cover aligner fully in the recess of the timing chain cover.

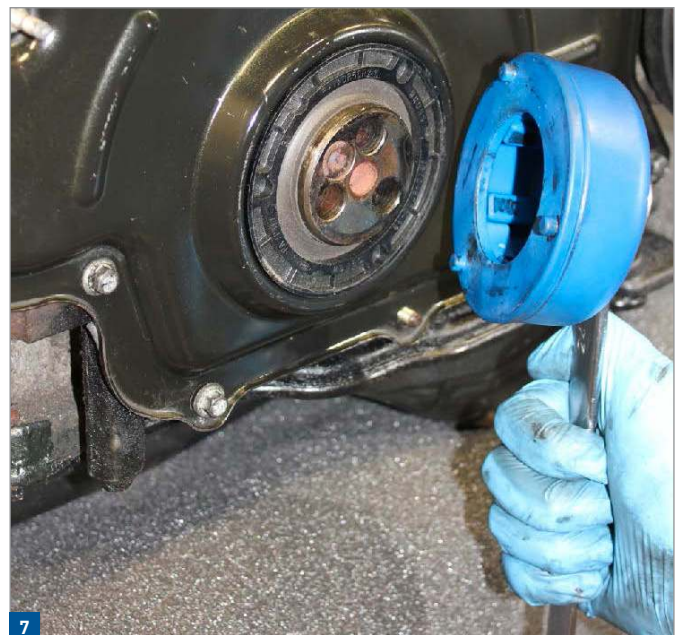
Apply a bead of sealant to the engine. Locate the timing chain cover on engine, ensuring that Timing Chain Cover Aligner ⑦ remains seated in the cover and is located on the nose of the crankshaft.

Install timing chain cover retaining screws and tighten to the prescribed torque figure. Remove Timing Chain Cover Aligner ⑦ from timing chain cover.

Assemble Timing Chain Cover Aligner ⑦ and Crankshaft Seal Installer ⑧, locate the assembled tool into the dimples of a new crankshaft seal.

Install the seal on the nose of the crankshaft, into the recess of the timing chain cover.

Rotate the tool assembly in a clockwise direction to lock the seal into the cover.



OIL PUMP ALIGNMENT

Removal and installation of the oil pump drive chain requires oil pump to be removed from the engine. The pump must be refitted in the correct position, sprocket teeth aligned to the crankshaft sprocket, to prevent premature wear and breakage of the oil pump drive chain.

Install AST5109 on the block, ensuring that the edges of the alignment tool are contacting the face of the oil pump sprocket, retain in position using one of the sump retaining screws and nut.

Remove the oil pump tensioner, the oil pump feed pipe, pump and drive chain.



ATTENTION

Do not remove oil pump alignment tool until the oil pump ⑤ assembly has been refitted in the correct position and the retaining screws have been tightened to their final torque setting.

FLYWHEEL LOCKING TOOL

AST5108 locates in the teeth of the flywheel to counter hold and prevent rotation of the crankshaft, this tool can be used during a number of operations and procedures such as flywheel, crankshaft pulley or timing chain removal and installation. Remove the starter motor, locate oil pump alignment tool ⑤ in the teeth of the flywheel and retain in position using the nut.



NOTES

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