



Technical Report #7

***Suggestions on the assembly of the
head gasket on 4 cylinder vm engines***

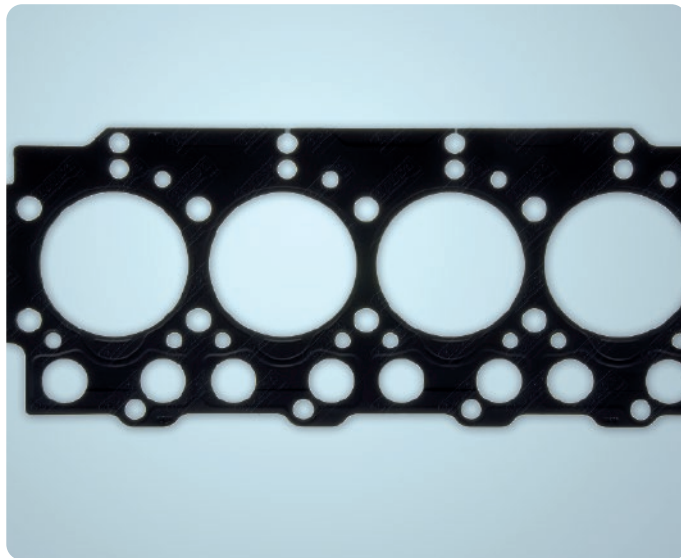
Technical report

Purpose

Inform all customers about some recommendations when assembling the head gasket on VM engines.

Introduction

At the beginning, VM engines had a cylinder head gasket on each head, Ajusa reference 10011500 with different thicknesses; further on, the engine builder decided to have an only head gasket for all the cylinders. Ajusa, following this philosophy, includes in its General Catalog reference 10119200 with different thicknesses for VM engine 425CLIEE 2499 cc.



Disassembly

- 1** *Before disassembly, it is recommended to let the engine cool down.*
- 2** *Disconnect ground cable of the battery*
- 3** *Empty the cooling system following the manufacturer specs.*
- 4** *Disassemble water manifold, intake manifold, exhaust manifold, valve cover, and all those components detailed on the vehicle repair manual, so that all heads can be reached.*
- 5** *Disassemble valve cover kits and pushrods.*

Nota: *valve covers and pushrods must be numbered in the same place where they were disassembled.*

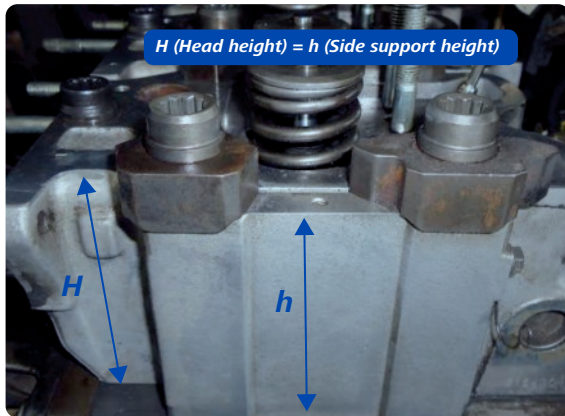
- 6** *Lose head bolts following specs on the repair manual and mark them; it is advisable to keep the same position on the assembly later.*
- 7** *Remove heads and head gaskets to be replaced.*
- 8** *Clean and degrease the heads and the block to prevent any dirt or liquids from damaging or oxidizing both surfaces.*

Check before assembly :

- 1** *Check heads and block flatness. Maximum deformation allowed is 0,05 mm. If there was a major deformation heads and block should be rebuilt.*
- 2** *Check head height is the same and is inside tolerances, as well as side supports.*



Nota: *If when checking, one or more heads has a major deformation, it is necessary to rebuild all heads. Respect tolerances of side supports on height.*

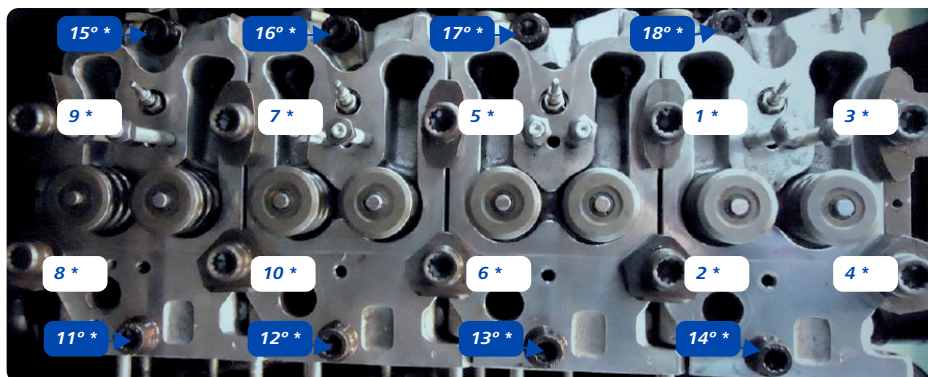


- 3** Check cylinder liner height respect the block. All measures must be made on the camshaft side. Obtained values must be between 0,01 mm and 0,06 mm
- 4** Check piston height respect the block to select gasket thickness

Reference	Thickness	Height	Notches
10119200	1.42 mm	0,53 mm – 0,62 mm	0
10119210	1.52 mm	0,63 mm- 0,72 mm	1
10119220	1.62 mm	0,73 mm – 0,82 mm	2

Assembly:

- 1** Place the toolings to center the gasket on the cylinder block.
- 2** Place the head gasket on the centering tools.
- 3** Assembly heads on the same position when they were disassembled., adjusting them with the centering tools, and taking care not to drop them; in case any damage is produced on the head gasket, it must be replaced.
- 4** Grease the bolts under the head and thread, and place them in their housing, hand- thread them, making sure that the metal piece of the tightening and side supports are in a correct position.
- 5** Make the same tightening procedure following the specifications that AJUSA includes with gasket 10119200 and different thicknesses.



1st stage: (*) (°) 3Kpm

Apply 3 kpm to all bolts using a torque wrench, in the specified order.

2nd stage: (*) 70° inside bolts / 85° outside bolts

Using a goniometer, apply 70° to the inside bolts (red squares), in the specified order.
Using a goniometer, apply 85° to the outside bolts (blue squares) in the specified order.

3rd stage: (*) 70° inside bolts

Using a goniometer, apply 70° to the inside bolts (red squares) in the specified order.

4th stage:

Assemble the rest of the engine components, fill cooling and oil circuit according to the manufacturer sepecs.

5th stage:

Run the engine until a complete opening of the thermostat, let the engine cool down in four hours and open the expansion vase of the cooling circuit.

6th stage: - 90° + 3kpm + 65° + 65° inside bolts

To every inside bolts (red squares), in the specified order, loosen 90°, tighten 3 kpm, apply 65° and apply 65° again.

7th Stage: (°) 9kpm outside bolts

With a torque wrench apply 9 kpm to outside bolts (red squares) in the specified order.