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# TECHNICAL REPORT

Suggestions on the assembly of  
the head gasket on 4 cylinder  
VM engines



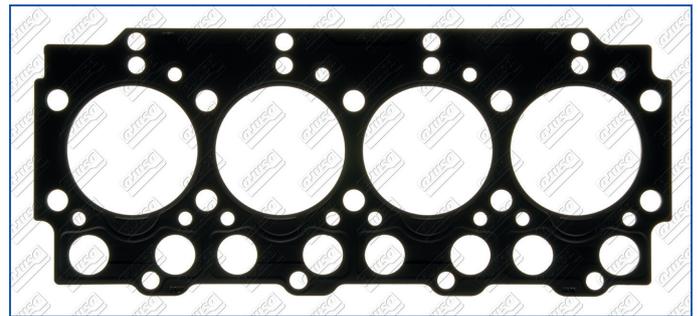
## PURPOSE

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.



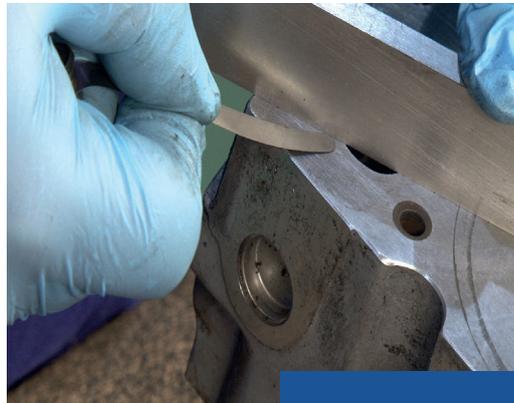
## DISASSEMBLY

- Before disassembly, it is recommended **to let the engine cool down.**
- **Disconnect ground cable** of the battery.
- **Empty the cooling system** following the manufacturer specs.
- **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.
- **Disassemble valve cover kits** and pushrods. Note: valve covers and pushrods must be numbered in the same place where they were disassembled.
- **Lose head bolts following specs on the repair manual and mark them**; it is advisable to keep the same position on the assembly later.

- **Remove heads and head gaskets** to be replaced.
- **Clean and degrease the heads and the block** to prevent any dirt or liquids from damaging or oxidizing both surfaces.

## CHEC BEFORE ASSEMBLY

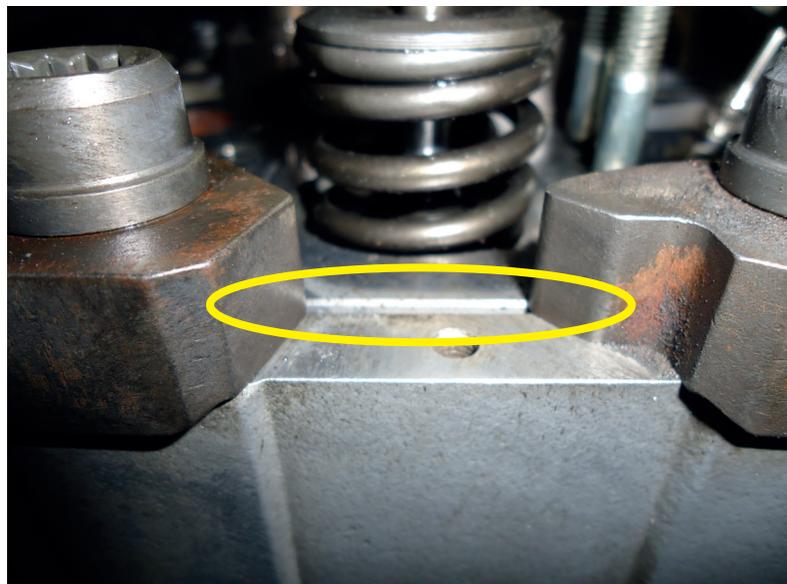
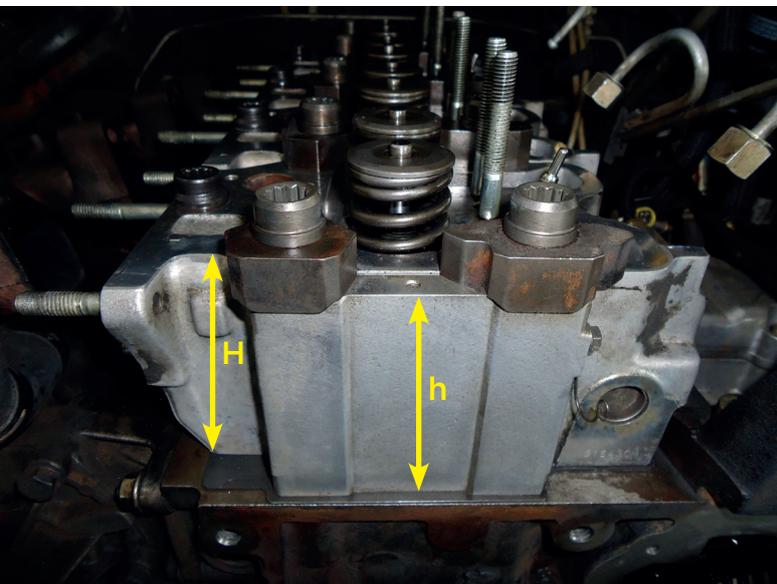
- Check heads and block flatness. **Maximum deformation allowed is 0,05 mm.** If there was a major deformation heads and block should be rebuilt.



- Check **head height is the same and is inside tolerances**, as well as side supports.

### NOTE

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.



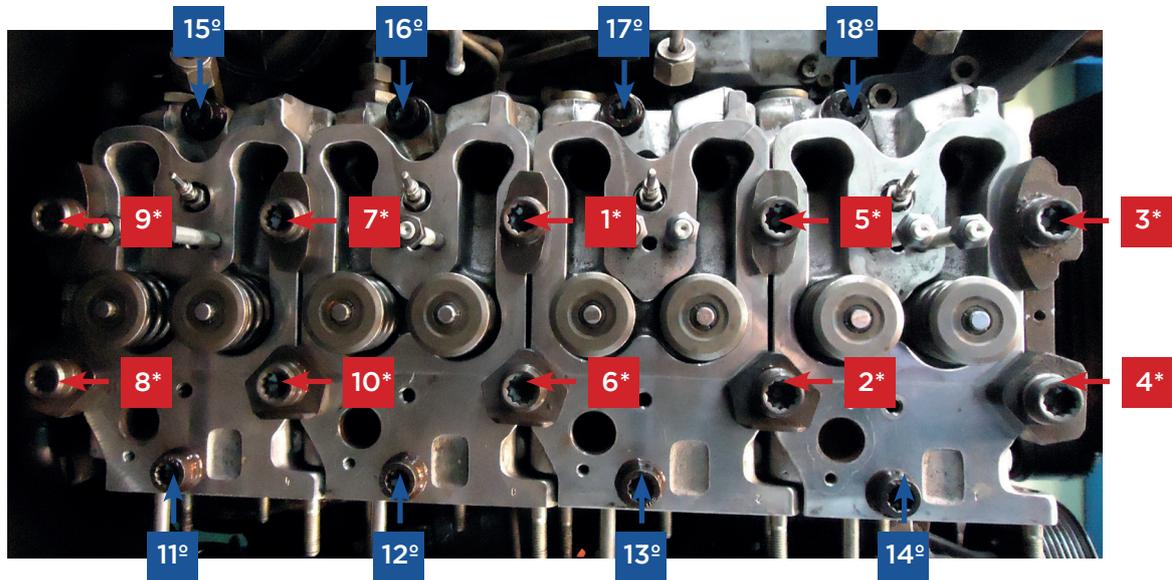
$H$  (Head height) =  $h$  (Side support height)

- **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.**
- **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-
101192220	1.62 mm	0,73 mm - 0,82 mm	-2-

## ASSEMBLY

- **Place the toolings to center the gasket** on the cylinder block.
- **Place the head gasket** on the centering tools.
- **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.
- **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.
- 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

To apply 9kpm to the outside bolts (blue squares), in the correct orden.