119

TECHNICAL REPORT

Head gasket thickness on petrol engines BMW, MINI, PSA

ajusa

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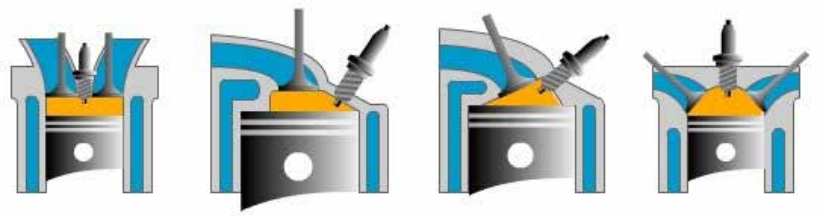
DESCRIPTION

On petrol engines, the **combustion chamber** cavity is usually carven into the cylinder head, located above the top of the cylinder, and its shape will depend on the combustion performance to be achieved.

The combustion chamber is designed to **concentrate the explosive force** of the burning fuel at the head of the piston and allow the flame front to propagate properly



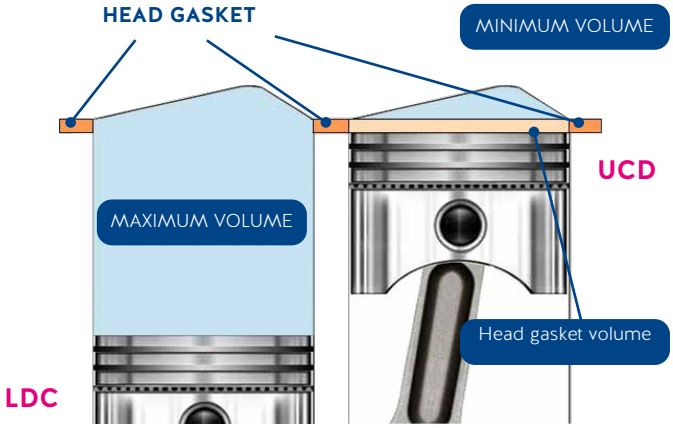
The **compression ratio** in the cylinder will be shaped by the maximum volume when the piston is at the upper dead center (UDC), and the minimum volume when the piston is at the lower dead center (LDC).

The **minimum volume** is the volume of the cylinder head gasket plus the volume of the combustion chamber in the cylinder head. The **maximum volume** is the sum of the minimum volume plus the cylinder unit volume.

$$rc = \frac{\text{Maximum volume}}{\text{Minimun volume}} = \frac{V_{cc} + V_u}{V_{cc}} = \frac{V_{\text{head gasket}} + V_{\text{cyliner head}} + V_u}{V_{\text{head gasket}} + V_{\text{cylinder head}}}$$

When a **cylinder head is repaired**, the volume of the original combustion chamber is reduced. If it is not taken into account, the compression ratio increases and phenomena such as the self-ignition of the fuel can appear.

This results in increased component wear, increased engine vibration and can cause problems in the connecting rod bearings or crankshaft bed.



Warning!

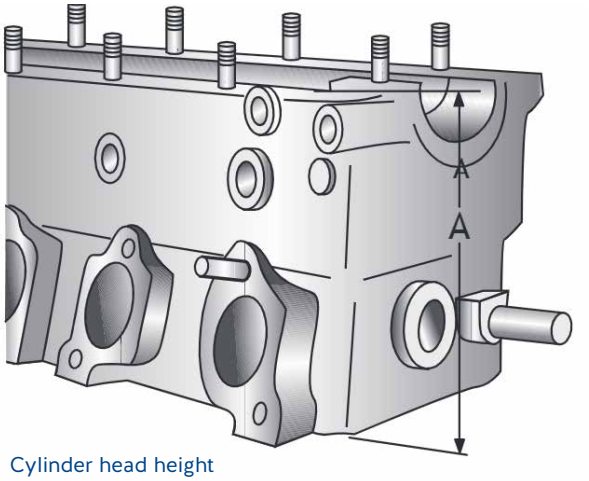
Cancel

It is important to keep in mind that the combustion chamber volume is maintained by increasing the thickness of the cylinder head gasket when repairing and grinding the cylinder head. That is why Ajusa offers **oversized cylinder head gaskets** to maintain the compression ratio originally calculated for the engine.

It is recommended that the rectification measure is **equivalent to the increase** in thickness of the gasket to be fitted, with respect to the original gasket, always respecting what is indicated in the workshop manual. This **ensures that the compression** ratio is maintained.

In other words, it must be ensured that the nominal height of the cylinder head (A) before grinding, is equal to the height measured after grinding (B) plus the thickness of the oversize gasket (e).

$$A = B + e$$

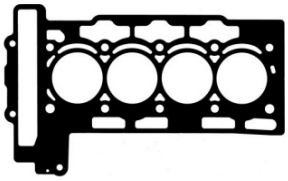


Cylinder head height

In Ajusa catalogue for BMW, MINI gaskets and the PSA group among others, there are two ways in which the oversize of the cylinder head gasket is defined.

CASE 1

It can be indicated by the thickness of the oversize gasket:

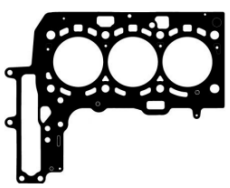


10186900 (MLS) Original gasket
(0.90)
10186910 ▲ (MLS)
(1.20)

ø78

CASE 2

It can be indicated by the increased thickness or material removed during grinding:



10220700 (MLS) Original gasket
10220710 ▲ (MLS)
(+0.30)

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