Head Gasket Replacement

The head gasket is a key component in a car’s engine assembly, and a blown gasket can cause serious damage and lead to major repairs. The head gasket is a seal that is fitted between the piston cylinder head and the engine block. The car’s engine is an internal combustion engine. For combustion to occur inside the piston chamber, high compression pressure must be achieved. The head gasket seals the combustion process and prevents the coolant and engine oil from mixing together in the combustion chamber. A blown head gasket can cause engine malfunction and significant loss of engine power. The following symptoms are indications of a blown head gasket:

- High temperature on engine temperature gauge. If the car is constantly overheating it may be an indicator of a blown head gasket.
- Low coolant level. If the car is constantly losing coolant, it may be because your car’s coolant is leaking from the cooling system into the oil pan. This happens when the head gasket is blown.
- Froth appearing on oil dipstick – if you notice froth on the dipstick, there may be coolant mixed in with the oil due to a faulty head gasket.
- Sweet smelling white smoke with water droplets coming from the exhaust pipe. This could be a sign that the head gasket has been blown off.

With the head gasket being such a key component, it is important to follow the following steps when replacing them.

Disassembly

Follow these three steps when removing the head gasket:

1. Leave the engine to cool down to ambient temperature
2. Open the cap of the expansion tank of the cooling system
3. Loosen the bolts in the inverse order to what they are tightened in
Cleaning

Clean and remove grease from the engine block and cylinder head surface, taking care not to cause any damage.

Flatness Inspection

Check for 'warpage' on both cylinder head and block surfaces – the maximum tolerance for any variation in the surface is 0.05mm.

Roughness Inspection

Multi-layer steel (MLS) gaskets do not adapt to high roughness on engine block and cylinder head surfaces. For this reason, if it is necessary to resurface some of these surfaces, the following values must be respected:

<table>
<thead>
<tr>
<th></th>
<th>MLS Gaskets</th>
<th>Fibre Material Gaskets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium Cylinder Head/Block</td>
<td>de 0.5 a 1.0 µm</td>
<td>2.3 µm MAX</td>
</tr>
<tr>
<td>Cast Iron Cylinder Head/Block</td>
<td>de 1.5 a 1.8 µm</td>
<td>3.8 µm MAX</td>
</tr>
</tbody>
</table>
Piston-Block Height Inspection

Check the piston-block height to get the correct gasket thickness that you need.

Pre-chambers Inspection

Check pre-chambers cylinder head surface overlap in diesel engines with indirect injection. Remove the pre-chambers before resurfacing.

Skim the housing, not the pre-chamber

0.04 max
Wet Liners Height Inspection

Check cylinder liners height, following OE specifications. The below example is for the Renault J8S 2.1 diesel engine.

Head Gasket Leaks

There are three main types of leaks that can occur from head gaskets:

Gases

These can come from the combustion chamber, through the fire rings and into the neighbouring combustion chamber, or alternatively from the combustion chamber into the cooling circuit.

Water

Water leaks can come from the interior to the exterior of the engine, into the oil circuit or into the combustion chamber.

Oil

Oil leaks can come from the interior to the exterior of the engine, or into the cooling circuit.

Damage Symptoms

Fire Paths
Possible causes:

- Lack of clamping load
- Engine components not flat

Possible causes:

- Sunk pre-chambers

**Deformed Fire Rings**

Possible causes:

- Bad injection adjustment
- High compression ratio
Broken Bridge

Possible causes:

- High roughness on gasket

Fibre Material Destroyed Close to Water Holes

Possible causes:

- Damaged cylinder liners
Linear Impressions can be seen

The Coating has Disappeared in the Functional Layer

Possible causes:

- The clamping was too low
- Engine components not flat
- Excessive resurfacing marks
- Air was not removed from the cooling system so the coolant did not circulate
- Cooling circuit was interrupted (faulty water pump, thermostat, radiator)
Overheating on FBX Gaskets

Brilliant Fibre Material/Water Holes Blocked

Lack of Fibre Material

Swollen Fibre Material at the Water Holes

Possible causes:

These symptoms are usually caused by an engine component that stops functioning correctly, such as:

- Thermostat
- Radiator (if the radiator has become plugged with calcium or rust deposits, an approved antifreeze with anti-corrosion agents should be used)
- Water pump

A **high compression ratio** can also cause the symptoms outlined above.

**Oil Leaks**

Symptoms of oil leaks include:

- The Viton reinforcements have been pressed away from the oil hole and cut or torn
- Dirt particles are present in the sealing groove of the Viton reinforcement or silicone track

Possible causes:

- Cylinder head lowered several times during installation
- Sealing element was compressed excessively due to insufficient liner protrusion

**Water Leaks – Signs of Corrosion/Dirt Particles/Fibre Material Damaged Close to Water Holes**

Possible causes:

- Low clamping load
- Dirty threads on engine block
- Oil or coolant liquid deposits in the housing of bolts
Replacement Head Gaskets

If you are looking for a replacement head gasket then BGA is an ideal choice, offering the following benefits:

- OE quality
- Largest range in UK Aftermarket
- Every gasket or seal is individually packed
- Technical data sheet included with headsets and head gaskets
- Associated parts detailed on product labels
- Universal kits compared to competitor coverage
- Multiple gasket thicknesses for diesel engines
- Complementary products also available: head sets, rocker covers, valve stem and shaft oil seals, inlet/exhaust manifold gaskets