12

TECHNICAL REPORT

Recommendations for the assembly of PTFE oil seals

PURPOSE

Describe the **suggestions** to take into account when **assembling PTFE seals.**

INTRODUCTION

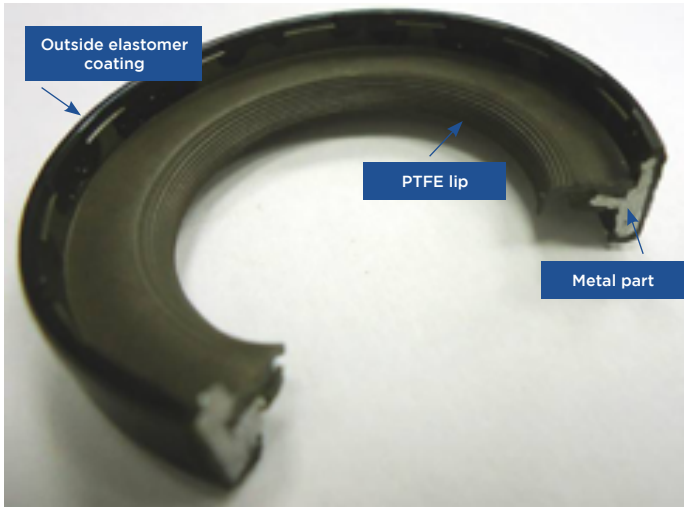
The engine performance of last generation make the **oil seals to work under** more and more **strict conditions**.

The polytetrafluoroethylene (by its acronym) and which is also known as **Teflon**, is a material with excellent thermic features in a wider range of temperatures than the rest of elastomers used in oil seals. Besides, **it is highly resistant to chemicals**, stress and wear.

COMPOSITION OF A PTFE

The **main differences** respect the rest of oil seals concerning composition is the **lack of a spring** which helps the lip seal where it is assembled.

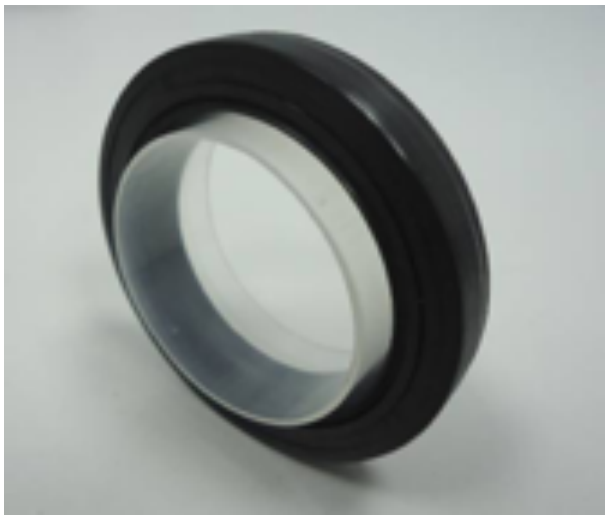
Generally, **PTFE** seals **are made up by a metal part**, an inside PTFE lip and an outside coating of acrylic rubber, though in some cases it may also be FKM (**Viton**) to **protect the seal of polluting particles**. In the case of industrial engines, the PTFE lip usually has a graphite coating, which allows certain lubrication.



Usual composition of a PTFE seal

RECOMMENDATIONS FOR ASSEMBLY

- It is **not recommended to remove the applicator** where the PTFE seal is assembled until installation is going to be made in the corresponding housing (see steps 5 and 6), since it may help during assembly.



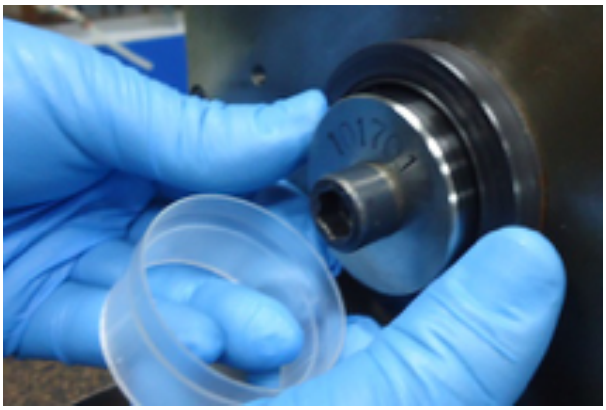
- If the seal is installed without the help of the applicator, special tools must be used (see repair manual).

- **Remove the seal to be replaced and the housing**, avoiding hitting and/or scratching the surfaces to be sealed. If burrs are present, they must be removed.

- **Verify** that both the housing and the **PTFE** seal are **dry** before assembly. **PTFE seals must NEVER be lubricated**.

- Place the applicator axis where the PTFE is assembled respect the housing axis.

- **Push the PTFE seal with a uniform movement** until it is perfectly settled in the corresponding place. At this step, the PTFE seal is separa ted from the applicator.



Assembly of the PTFE seal in its housing

- It **must be four hours** since the installation of the seal **until the engine is started**, to allow it to completely adapt to its housing.

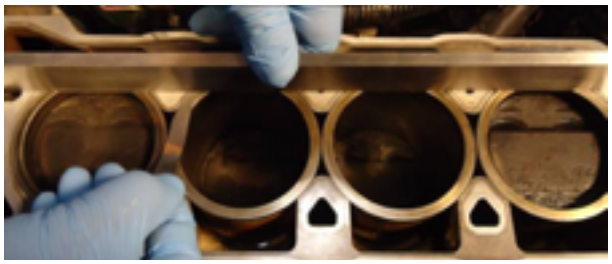
- Check flatness of head and block. Maximum value of deformation allowed is 0,05 mm. If deformation is higher than allowed, the head of these engines can be machined.

  For a value of **0,20 mm** or under, it is not necessary to use the shim included in the set.

- Si por el contrario, **el rectificado es > 0,20 mm, es necesario montar la lámina de suplemento** que forma parte del juego 55013000. En este caso, el orden de montaje de la junta de culata y el suplemento, es el que mostramos a continuación.

head

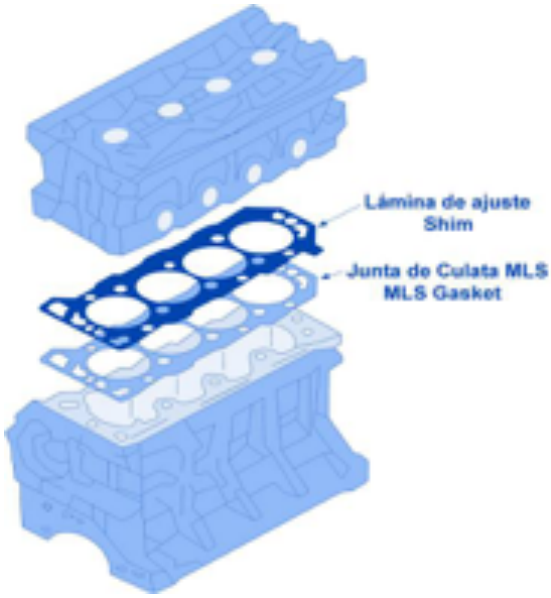
block



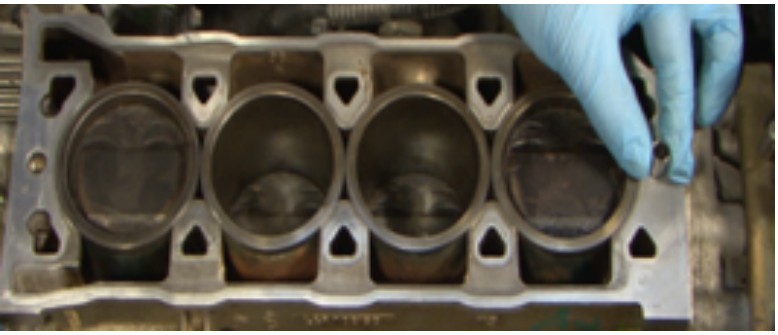
shim

head gasket

Our head gaskets are marked with AJUSA on the head side, indication assembling.

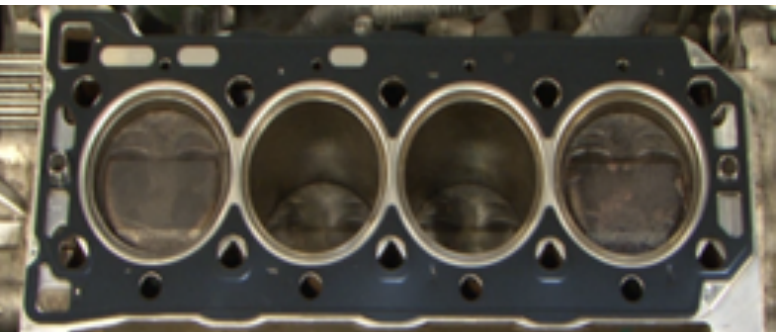


- Place the 2 dowel pins of kit 55013000 to make the centering **of the head gasket on the cylinder block easier.**



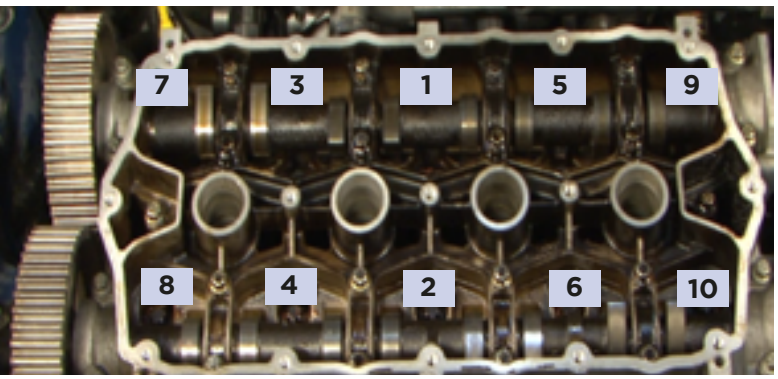
> *Do not turn the crankshaft once you you remove the tools to pin up liners.*

- Disaseemble toolings **to block the liners of the engine** and place the new head gasket of kit 55013000.



- Place **the head on the block**, adjusting with dowel pins; do not drop or hit the head gasket; if this happens, it is recommended to replace the head gasket.
- Lube the bolts under the head and thread and place in their housing by hand.

- Proceed **to tightening following the specs** included in the AJUSA kit 55013000.



1st STAGE: 2 kpm
With the torque wrench, apply 2kpm to all head bolts in the specified order.

2nd STAGE: 90º
Apply 90º to all head bolts with a goniometer in the specified order.

3rd STAGE: 90º
Apply 90º to all head bolts with a goniometer in the specified order.

4th STAGE: 90º
Apply 90º to all head bolts with a goniometer in the specified order.

5th STAGE: 90º
Apply 90º to all head bolts with a goniometer in the specified order.

- **Assemble camshafts** following the specs on the repair manual.
- **Assemble intake and exhaust manifolds,** valve cover and all those components detailed in the vehicle repair manual.