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TECHNICAL REPORT

Crankshaft seal with
trigger wheel



01 introduction

The crankshaft seal is a fundamental element in any ICE since it is **responsible for guaranteeing the sealing** of the engine crankshaft.

However, there is currently a type of seals that perform other tasks apart, such as detecting the number of engine revolutions, crankshaft position, determining the injection point and even controlling the ignition.

This is achieved thanks to a **trigger wheel** thaty it is integrated in the seal itself. They form an integrated sealing system.

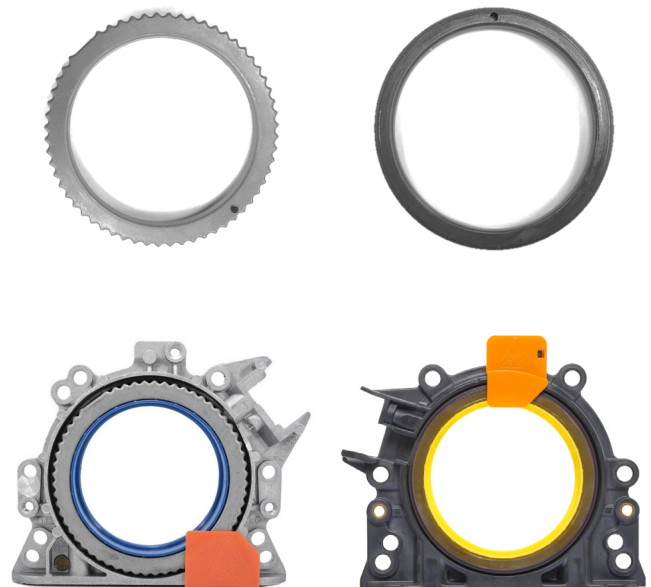


02 development

The trigger wheel is responsible for generating a series of **electromagnetic pulses** that are read through the CKP sensor (Crankshaft Position Sensor) and that tell the command control unit the position and rotational speed of the crankshaft.

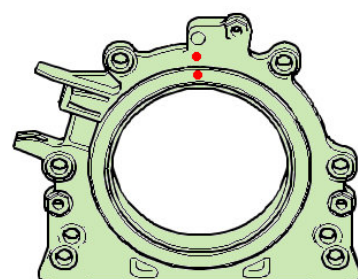
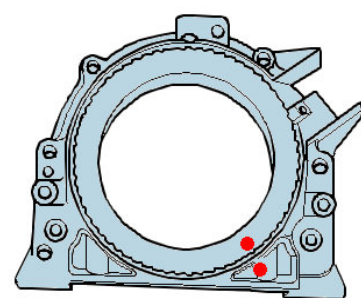
There are mainly **two types of trigger wheels**. The first where the pulses are generated physically with discontinuities in the wheel, and the second where the pulses are generated magnetically.

The trigger wheel has a small reference hole to position it.



The **position of the trigger wheel** is very important. If it is not in the correct position when it is installed on the crankshaft, the engine will not start.

Normally the seal usually has a reference mark on the housing, and another mark on the trigger wheel, these must be **aligned** in the event that the locking tab is removed





Do not remove the locking tab from the trigger wheel or the applicator **until** the seal assembly operation is complete.

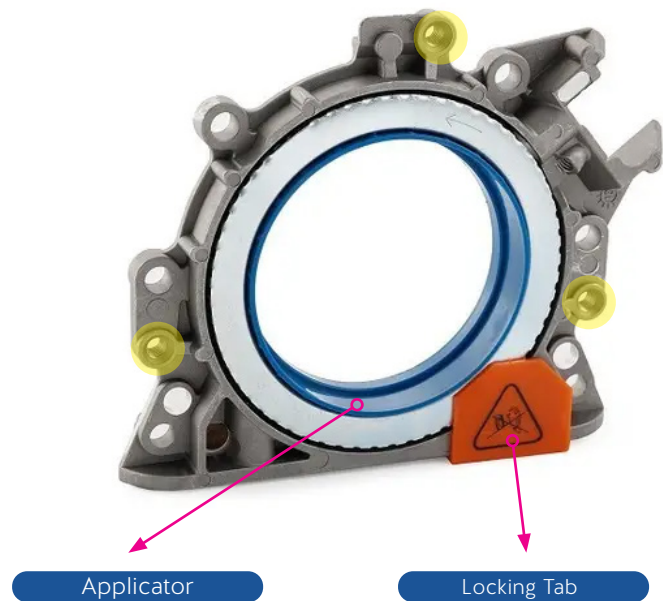
Before starting assembly, it is necessary to put cylinder 1 in the top dead center (TDC) position, this operation is known as **engine timing**. This will vary from one engine to another, so it is necessary to consult the workshop manual to carry out this operation.

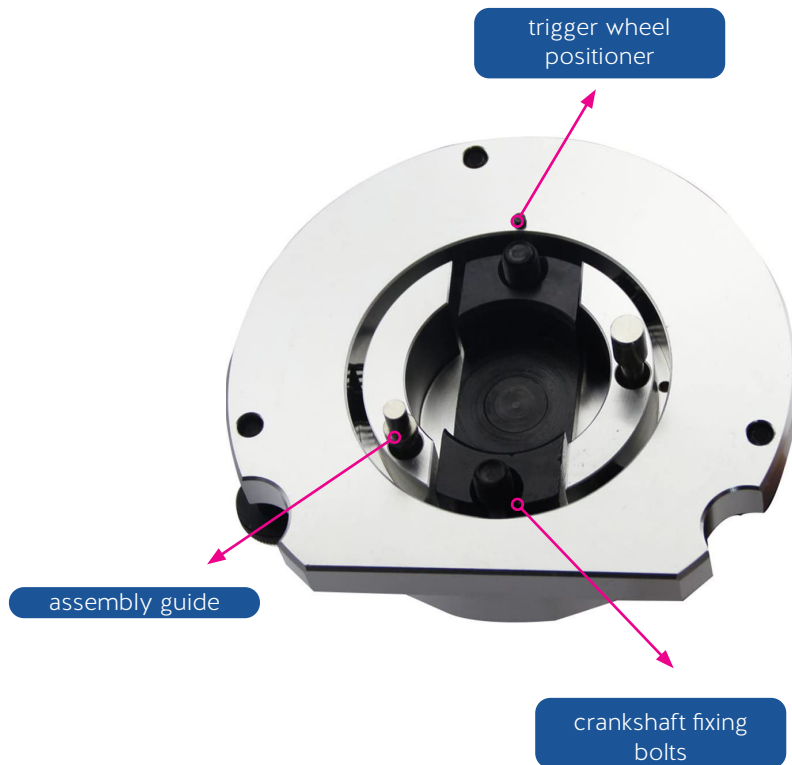
To remove the old seal, it is necessary to use 3 M6 screws to extract the seal housing and the trigger wheel.

It is recommended to use the assembly tool for the type of seal. It will ensure that the seal fits completely straight without damaging the lip, as well as that the trigger wheel is in the correct position and does not move during the assembly operation.

If you have the assembly tool, the locking tab of the tone wheel can be removed.

● Housings for extraction/fastening screws





STEPS TO FOLLOW FOR A CORRECT ASSEMBLY

1. Position the seal on the tool

The hole of the seal **must coincide with the positioner** of the trigger wheel. Then the seal bolts are tightened to position it, making sure the seal is fixed and level.

2. Mounting on the crankshaft

Afterwards, you must carefully positioned the tool with the seal on the crankshaft, making sure that it is **parallel**, and the fastening screws are slightly tightened. It is also necessary to **slightly tighten** the side housing screws to guide the seal. Subsequently, the guide is introduced to position it correctly, and the fixation screws are completely tightened.


3. Application of the tightening torque

Later, tighten adjusting nut until a tightening torque of 35 Nm. In this operation, the seal housing will be completely adjusted to the block and the phonic wheel will be pressed into the crankshaft with the correct depth so that it can be read by the sensor. **Remove the tool** and tighten the 6 fastening screws of the seal to the block applying the tightening torque indicated in the workshop manual.

4. Check depth

The assembly tool is removed and the depth of the phonic **wheel is verified**, this should be around 0.5 mm with respect to the crankshaft. If the depth is less, the tool must be reassembled and a tightening torque of 40 Nm must be applied. If after rechecking the depth is still less, increase the torque again in increments of 5 Nm



**Warning!**

PTFE type seals need to wait a minimum of **4 hours for the sealing** lip to adapt to the diameter of the shaft. **Do not start the engine before the indicated time.**