

Oil filter leakages are always assembly errors—which have fatal consequences. With any luck, the oil leakage is so substantial that it can be detected during the test run in the repair shop and immediately eliminated. It's worse when the customer only notices the oil leakage after driving for a couple of kilometres, when the oil light comes on—and ultimately, a new engine is needed. It becomes a tragedy when the oil left behind on the road causes an accident. To ensure this doesn't happen to you, we would now like to play a little game with you.

CAN YOU SPOT THE difference?

WHY ATTENTION TO DETAIL IS IMPORTANT WHEN CHANGING THE OIL FILTER AND WHAT YOU NEED TO LOOK OUT FOR TO ENSURE A SAFE REPAIR. A "SPOT THE DIFFERENCE" PICTURE USING THE EXAMPLE OF THE MAHLE OIL FILTER OX 171/2.

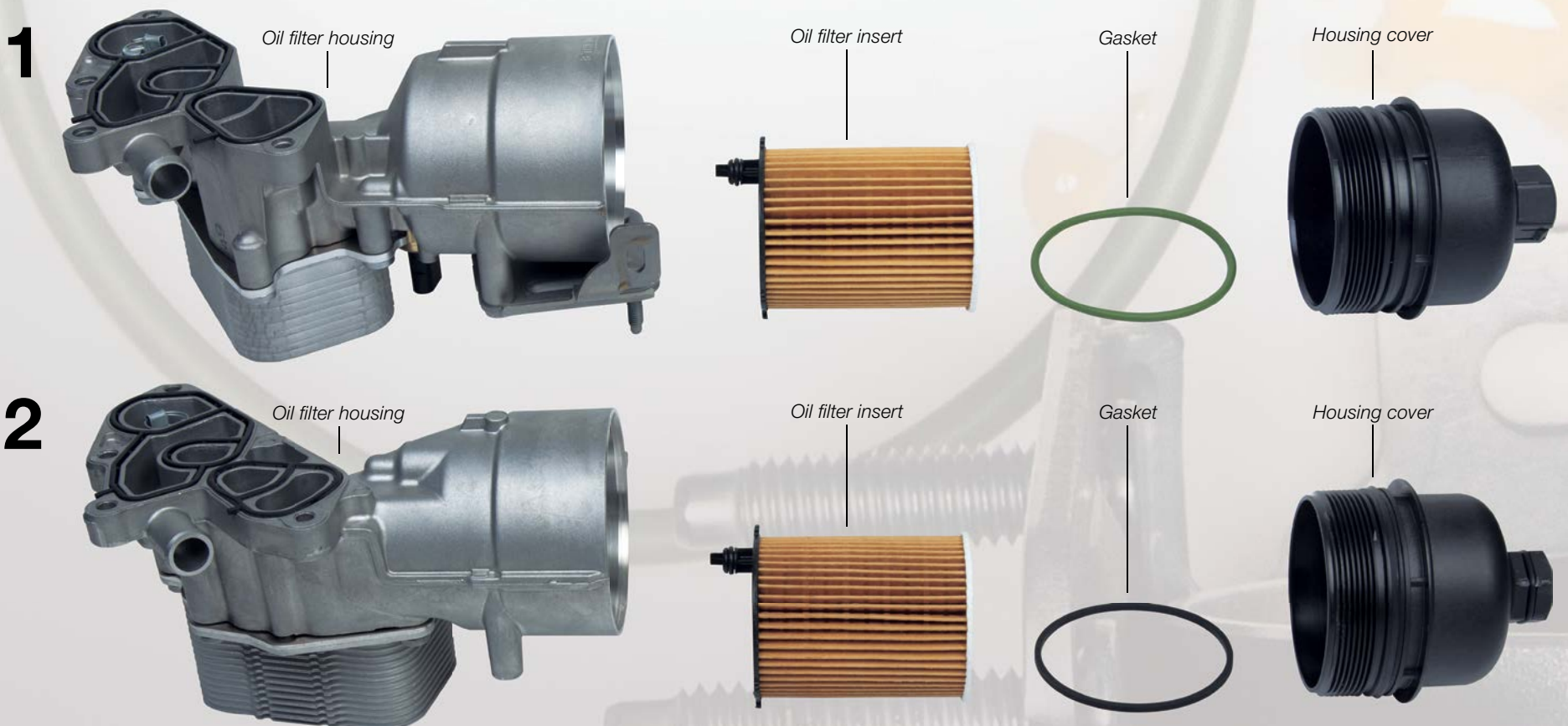


Figure 1 shows an **oil filter housing**. Figure 2 also shows one—with a few differences in the outer form of the two oil filter housings. Next to it you will recognise the **oil filter insert**.

It not only looks identical—it is identical. The **gasket** looks different at first glance because of the colour. In the **housing cover**, however, no difference can be seen initially.

Conclusion: the filter element (in this example: OX 171/2) is exactly the same, although there are small differences between the two filter modules.

THE SAME FILTER, DIFFERENT HOUSING—WHY?

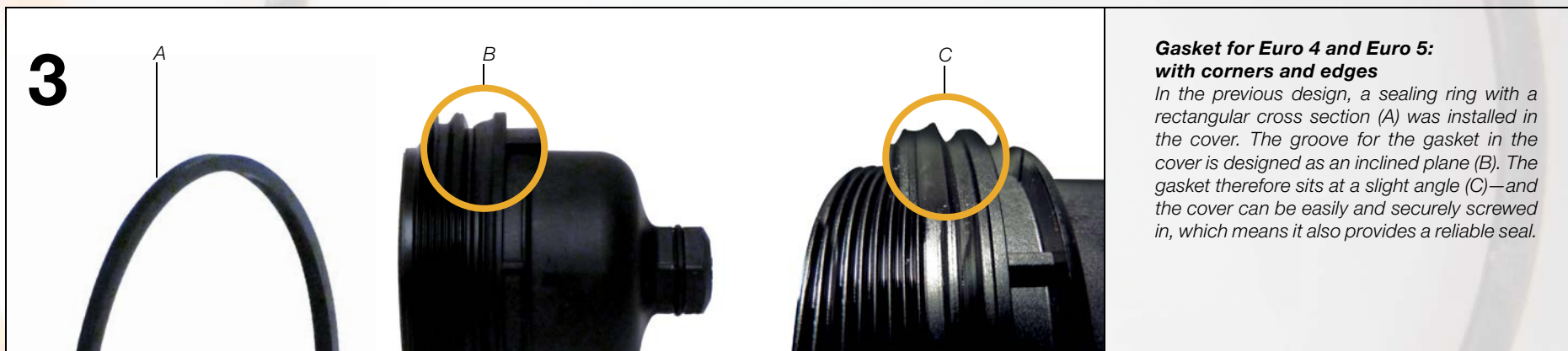
As a partner to the automotive industry, MAHLE is required to constantly improve its products. For this reason, the MAHLE engineers maintain a close dialogue with the car manufacturers' engineers. MAHLE develops, designs, constructs, builds, and tests the products exactly according to the specifica-

tions of the engine manufacturer (and often even a bit better). Therefore, the MAHLE product range consists of a number of constantly optimised products for both the aftermarket and the original equipment market, which differ from one another depending on the year of manufacture and application.

THE OIL FILTER FOR THE EURO 4 AND EURO 5 GENERATIONS OF ENGINES

Figure 3 depicts the MAHLE oil filter module for the popular 1.6-litre turbo-charged diesel engine from PSA Peugeot Citroën. This module was devel-

oped by MAHLE for the Euro 4/Euro 5 generation of engines and has since been delivered millions of times complete with mounted filter element, gaskets, and properly tightened cover, directly to the engine plant's assembly line.



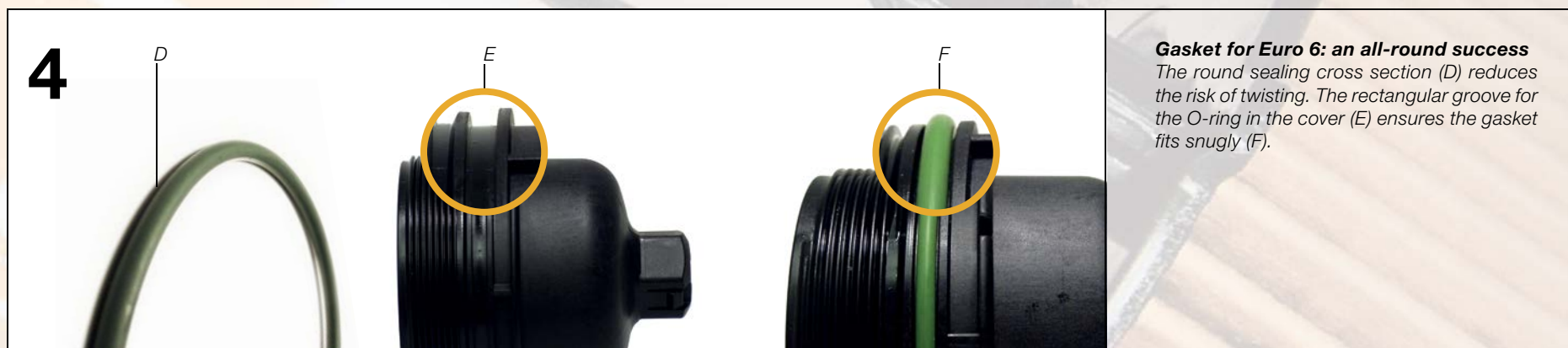
Gasket for Euro 4 and Euro 5: with corners and edges

In the previous design, a sealing ring with a rectangular cross section (A) was installed in the cover. The groove for the gasket in the cover is designed as an inclined plane (B). The gasket therefore sits at a slight angle (C)—and the cover can be easily and securely screwed in, which means it also provides a reliable seal.

NEW GENERATION OF ENGINES, NEW REQUIREMENTS

The Euro 6 places even higher demands on the engine as an overall system. Each individual component of the engine needs to be prepared to meet the more stringent exhaust emission standards. The oil circuit is also subject to increased stresses—such as higher temperatures or longer maintenance intervals. The oil filter module has been adapted accordingly, down to the last detail. This can be seen in Figure 4.

What's striking is that the OX 171/2 filter has remained the same; its performance is perfect for the new generation of engines. The most important change is the gasket. At first glance, you'll notice that the gasket is now green instead of black. A closer look shows, however, that it is designed differently. The new additional variant is called OX 171/2D1.



Gasket for Euro 6: an all-round success

The round sealing cross section (D) reduces the risk of twisting. The rectangular groove for the O-ring in the cover (E) ensures the gasket fits snugly (F).

A FOUR-POINT PLAN FOR REPLACING THE GASKET

Each MAHLE filter is delivered with the appropriate gasket. This, too, should always be replaced at every filter change—after all, it has aged together with the filter, was constantly in contact with the chemical components of the engine oil, and has experienced countless changes in temperature. We recommend the following procedure for replacing the gasket:

Position precisely. The new gasket must fit precisely into the groove provided in the cover (figure F) and not to the left or right.

Proceed gently. On no account is the gasket to be assembled with a pointed or sharp tool. A small, slightly rounded plastic pen is ideal.

Keep it straight. The gasket must not be assembled in a twisted position (this risk applies particularly to gaskets with a rectangular cross section). The correct fit should always be checked along the entire circumference of the housing.

Oil well. Rub fresh engine oil on the new gasket, the small O-ring on the pin, and also on the filter's fluid end plate. This will make assembly a great deal easier, and reduces the risk of damage.

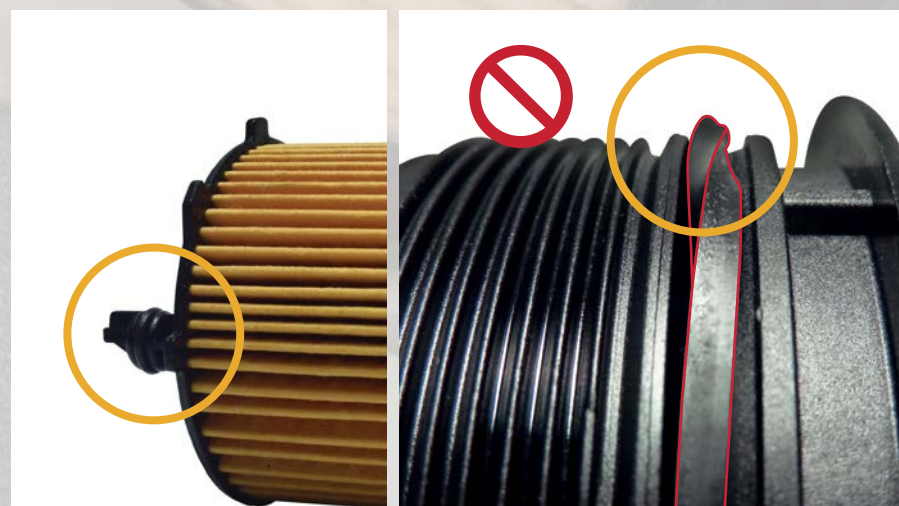
HOW TO AVOID MIX-UPS AND MISTAKES

The range of gasket types is huge—and the risk of a mix-up is just as great. Several filters are available on the market with different gasket variants: the leader is the OX 153 oil filter, which has five different gaskets and sealing kits in its range, depending on the vehicle, engine, and year of manufacture. Other filters can be used independently of the vehicle and even the manufacturer, albeit with specific gaskets in some cases. This is how you can eliminate the risk of a serious mix-up:

Step 1: compare data. Pay close attention to the specifications of the engine and vehicle data (you can find these in the MAHLE Aftermarket online catalogue). These provide information about which filter with which gasket variant is intended for the respective engine.

Step 2: pay attention. Before replacement, a comparative visual inspection is recommended. If the old and new gaskets are different: go back to step 1!

Why is a mix-up so dangerous? If the (new) O-ring has too little space in the old housing cover, it will be squeezed too tightly and become damaged and therefore leaky. It is equally problematic the other way round: the (old) black rectangular gasket in the new housing only sits loosely in the groove—and therefore doesn't work. The result: loss of oil.



Don't forget to oil: the O-ring on the pin and the fluid end plate.

A gasket that has been assembled in a twisted position (housing cover for Euro 4 and Euro 5 engines): it cannot seal properly!