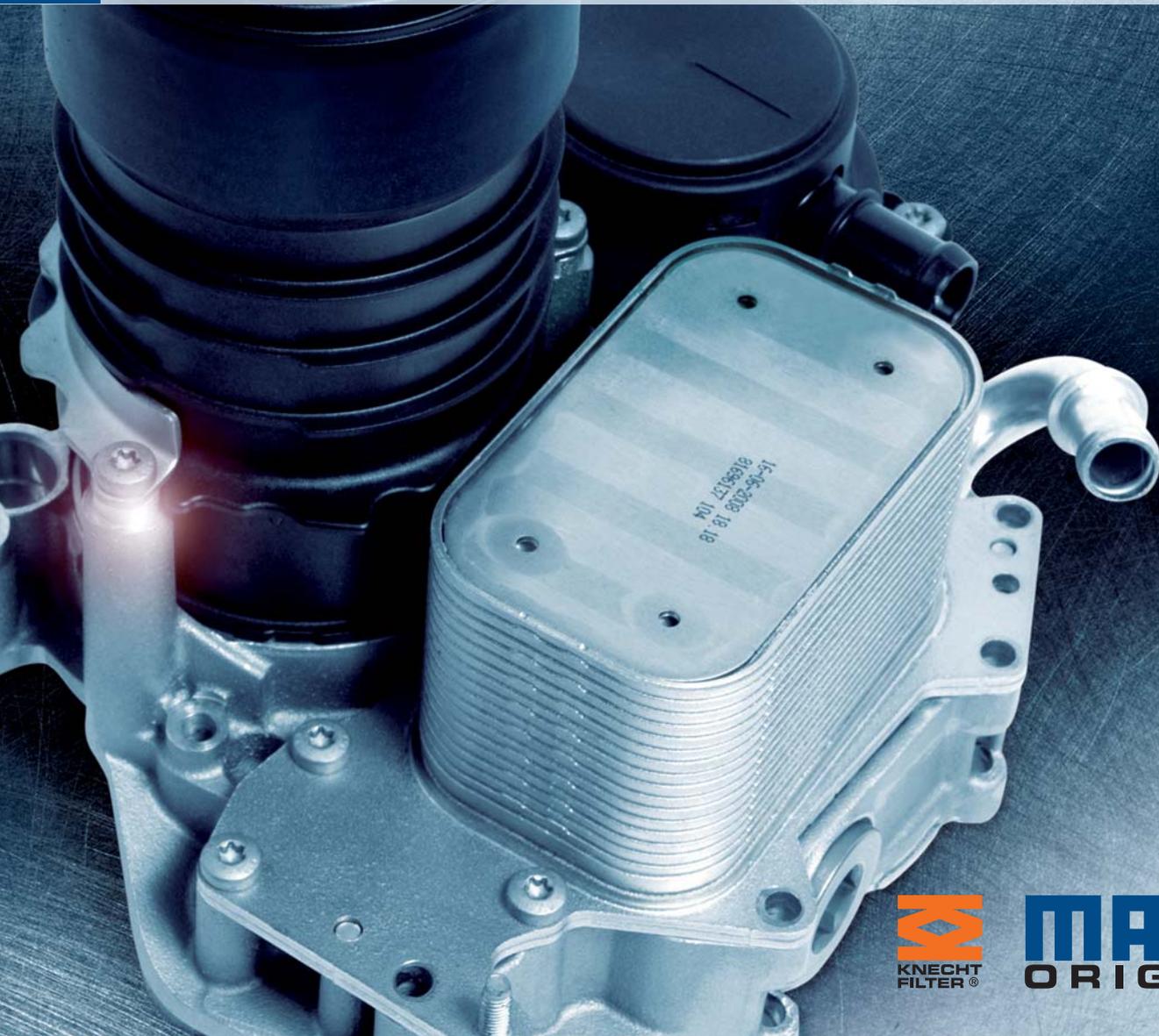


# MAHLE

*Driven by performance*

# OIL FILTER MODULES WITH ALL-PLASTIC OIL FILTERS

MAHLE – COMPETENCE TRANSFER, FROM THE ORIGINAL EQUIPMENT TO THE AFTERMARKET.



**MAHLE**<sup>®</sup>  
**ORIGINAL**

Developing complex oil filter modules and producing them in series has always been one of MAHLE's core competencies. With the example of MAHLE oil filter modules for the V6 and V8 diesel engine units of VW/Audi, we want to show you what a modern filter system is capable of achieving, which challenges had to be mastered for their development, and finally how both the retail trade and the workshop can also profit from the wearing parts.

## DEVELOPMENT PARTNERSHIP – FROM THE VERY BEGINNING

Oil temperatures up to 150°C, oil pressures up to 16 bar – the oil filter to be developed for the V6 and V8 diesel engines of VW/Audi had to withstand extreme thermal and compression-end loads. Furthermore it had to satisfy vehicle-specific design requirements, work reliably, weigh as little as possible and manifest a good cost-benefit ratio.

In order to satisfy these complex requirements and achieve the optimal solution for the respective vehicle applications, automobile manufacturers integrated the experienced system supplier MAHLE at a very early stage in their development processes. In a development period of only two to three years, MAHLE managed to put filter modules tailored exactly to the vehicle engines into series production.

## MAHLE OIL FILTER MODULES: 3 IN 1

The oil filter modules developed by MAHLE unite three functions: oil filtration, oil cooling and oil mist separation. Because several components are accommodated on a single support plate, they are also called "hybrid modules".

The oil filter assembly consists of a cover, a housing, the filter element with an all-plastic oil filter, and a filter by-pass valve with an integrated clip for the oil filter insert. The by-pass valve in the cover guarantees a reliable supply of the engine lubrication points at a cold start or filter malfunction (i.e. an excessively soiled filter). To reduce weight and increase seal effectiveness, fiberglass-reinforced high-capacity plastic is employed instead of the otherwise usual aluminum die casting alloy.

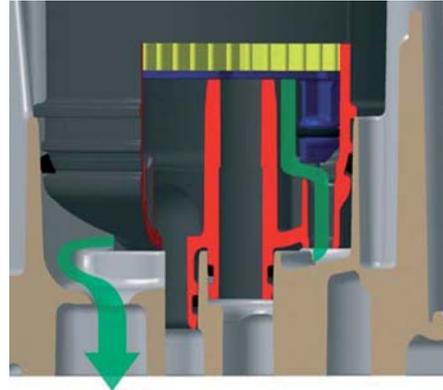


*MAHLE oil filter module – several components are accommodated on a single support plate.*

**LIGHT, HIGH-PERFORMANCE, FLEXIBLE,  
ECONOMICAL AND VERY EASY TO MAINTAIN**

The MAHLE oil filter modules offer diverse advantages:

- Up to 15% weight saving compared to oil filters with aluminum housing
- Excellent cost effectiveness by reducing individual modules into a total system
- Possibility of structuring more functionalities into the modular design and making these structurally flexible
- Reliable supply of the engine points of lubrication with a by-pass valve
- High seal effectiveness
- Easier accessibility of the modules
- Service-friendly due to the integration of a reliably functioning drainage system patented by MAHLE which prevents intermixing of unfiltered and filtered oil
- Simple replacement – by unscrewing the cover with a socket wrench, the element can be effortlessly pulled out of the housing



*Detail section of the lower part of the filter housing with the oil drain function to simplify an oil change – the arrow shows the drainage direction of the oil.*

**GOOD TIMES FOR FILTER REPLACEMENT**

The heart of the module is an oil filter element made of fully incinerable plastic end disks and long-life filter paper. These elements are available in two variants which differ from one another depending on the model year, engine code and chassis number:

- OX 196/1D ECO
- OX 196/3D ECO

The recommended change interval for both variants is 30,000 km or two years.

These two oil filter elements are installed in various TDI engines of VW and Audi cars:

- V6 engines (120–176 kW) of Audi A4, A5, A6, A8, Q7 as well as VW Phaeton and Touareg
- V8 engines (202–240 kW) of Audi A8 and Q7

Currently more than 400,000 vehicles on Europe's roads are equipped with this module – hence an enormous servicing potential.

**FILTER COMPETENCE FROM ONE SOURCE**

Apart from the oil filters described here, MAHLE also has fuel, air and cabin air filters in its program for the corresponding vehicle models, which like all MAHLE products are distinguished by exact fitting accuracy, high functionality and reliability ... providing a significant contribution to the satisfaction of your customers.



*The heart of the filter module: the oil filter element of fully incinerable plastic end disks and long-life filter paper.*

Manufacturer	Model series	Air filter	Fuel filter	Cabin air filter	Transmission oil filter
Audi	A4, Allroad 2.7	LX 2092 D, LX 819	KL 596, KL 599	LA/LAK 93, LAK 386	HX 84 D
	A4, Allroad 3.0	LX 2092 D, LX 819	KL 596, KL 599	LA/LAK 93, LAK 386	-
Audi	A5	LX 2092 D	KL 596	LAK 386	-
Audi	A6, Allroad 2.7	LX 1006/1 D	KL 454	LA/LAK 239	HX 84 D
	A6, Allroad 3.0	LX 1006/1 D	KL 454/ KL 554	LA/LAK 239	-
Audi	Q5	LX 2092 D	KL 660	LAK 386	-
Audi	Q7	LX 792/793	KX 192	LAK 182	-
VW	Phaeton	LX 1479	KX 178 D	LAK 225/S	HX 84 D
VW	Touareg	LX 792/793	KX 192	LA/LAK 182	-

*Complete range see filter catalog.*

# MAHLE

*Driven by performance*

[www.mahle-aftermarket.com](http://www.mahle-aftermarket.com)

000007603E.FB.10/09

