



MAHLE Insider

MAHLE



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Products for a
growing market
Repair parts in MAHLE quality

New product range for engine peripherals

Innovative in original equipment, strong in the aftermarket: MAHLE is a high-performance partner for its customers in all markets. We offer our customers a broad product portfolio covering engine systems and components, filtration, electrics/electronics and thermal management. Our focus is along the powertrain and air conditioning technology—for drives with combustion engines as well as for e-mobility.

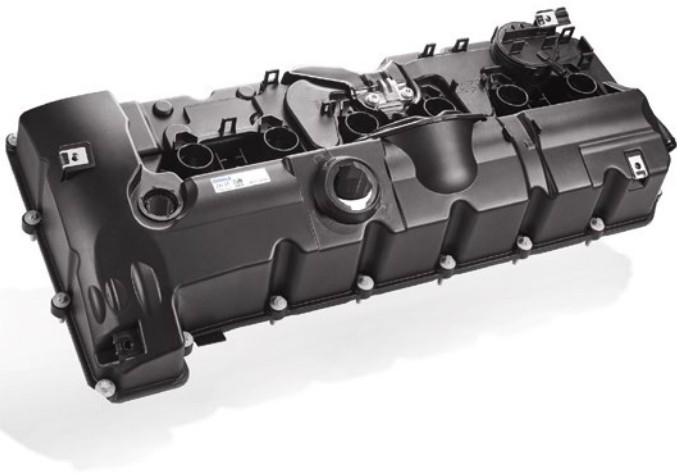
Many components and systems that MAHLE develops and produces for vehicle manufacturers are designed for a vehicle's life. In the case of combustion engines, we are seeing a trend toward an aging fleet of vehicles—worldwide. This creates an additional demand for spare parts. Reasons for this include mechanical damage or failure, material fatigue or consequential damage due to deferred maintenance.

MAHLE is building a new product range around engine peripherals to offer our customers repair parts of proven quality for this growing market. Repair parts such as air intake modules, cylinder head covers and oil filter modules are the first in line. This new range is being continuously expanded. The quality of products “Made by MAHLE” has clear advantages in the aftermarket: It ensures reliable function and a well-protected motor.



Designed
for a
vehicle's life

Cylinder head cover/ valve cover



Product description and functions

Cylinder head covers close off the cylinder head and generally form the upper closure of an internal combustion engine. To optimize costs and weight, they are usually made of highly stable thermoplastics material. However, there are also hybrid hoods made from a combination of thermoplastics material and aluminum. Cylinder head covers have to meet stringent requirements in terms of engine acoustics and leak tightness. As a visible component, however, they also fulfill a certain design requirement.

But cylinder head covers can do even more: Modern designs integrate further components such as oil mist separators, pressure-regulating valves, check valves or vacuum tanks. They also perform

additional functions such as fixing ignition cables and fuel lines, the wire harness and the oil filler tube. This integration in one assembly makes cylinder head covers a technically and geometrically complex product that must withstand high loads and temperatures over a long running time.

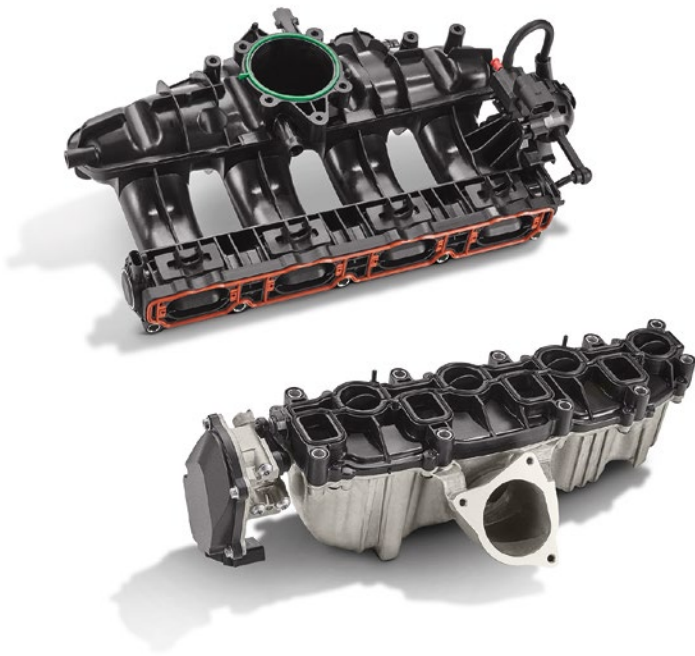
Reasons for failure and impact

As an assembly on the combustion engine, cylinder head covers are exposed to strong vibrations and temperature fluctuations. The natural aging of the material does not stop at cylinder head covers and their individual components. As a result, the plastic can warp and the material can fatigue. Over-tightening the bolts can also lead to distortion or fracture/cracking of the component, as can mechanical damage after an accident. A defective cylinder head cover is indicated by leaks.

Program overview

MAHLE cylinder head covers for the aftermarket	
ZH 21	suitable for:
expected to	BMW 1 Series (E81/82/87/88)
be available	BMW 3 Series (E90/91/92/93)
beginning in	BMW 5 Series (E60/61 + F10/11)
June 2023	BMW 6 Series (E63/64)
	BMW 7 Series (F01/02/03/04 + E65/66/67)
	BMW Z4 (E85/86/89)
	BMW X1 (E84)
	BMW X3 (E83, F25)
	BMW X5 (E70)

Air intake module



Product description and function

With increasing emissions regulations and lower fuel consumption requirements, combustion engines must become ever more efficient and cleaner. Air intake modules play an important role in modern and complex combustion engines. They perform far more functions than just filtering and distributing the air volume across the cylinders. For example, MAHLE has taken a major development step for the modern combustion engine by integrating charge air cooling into the air intake module.

An air intake system from MAHLE results in a clean, even, and low-resistance air flow for better performance and lower consumption. At the same time, air intake modules have to withstand ever higher temperatures and optimize acoustics—and all this with less and less available installation space under the hood.

Reasons for failure and impact

Air intake modules are inherently maintenance-free. What damages them is superheating due to a cooling system not functioning optimally. However, short-distance operation of the vehicle and a defective EGR valve can also lead to soot deposits and have a negative effect on the performance of the air intake module. As a result, plug connections and other plastic components can become brittle and leaky, leading to leaks in the cylinder head.

Furthermore, damage to the turbocharger, the throttle valve and other components upstream of the intake manifold can result in irreversible damage to the intake module.

Program overview

MAHLE air intake modules for the aftermarket	
LM 2 available beginning in March 2023	suitable for: Mercedes-Benz W202/W203 (4-cylinder diesel)
LM 3 available beginning in March 2023	suitable for: Mercedes-Benz W202/W203 (5-cylinder diesel)

Oil mist separator

Product description and functions

Most oil mist separators are integrated into the cylinder head cover. They separate gaseous and liquid components from the oil mist found in the crankcase ventilation system. The separated oil is returned to the oil circuit and the residual air to the intake system. Oil mist separators must have a very high separation level because engines with exhaust gas turbochargers are particularly sensitive to oil components in the exhaust gas. This makes oil mist separators an important component in compliance with the strict exhaust emission standards.

Reasons for failure and impact

The aggressive oil mist in particular, but also the high pressures and temperatures, cause problems for the diaphragms and gaskets in the oil mist separator. As a result, the elastomers may become brittle and the installed springs may fatigue. All this leads to the system no longer functioning as intended, and in the worst case it can even become leaky, and thus leakage can occur.

Program overview

So far there are no MAHLE oil mist separators defined for the aftermarket. The first products will be added to the range at the end of 2023.



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Oil filter module/ oil filter cover



Product description and functions

In most cases, the oil filter module is flange-mounted directly to the engine block. High-performance plastics and aluminum pressure die-casting elements are used for the housing—for high stability and low component weight.

In addition to filtering and cooling the oil in gasoline and diesel engines, oil filter modules perform many other functions in modern vehicles. These include optional oil mist separation, sensor technology

for pressure and temperature control, regulation for oil pressure and crankcase pressure regulation or, for example, thermostat-controlled regulation of the oil flow to the heat exchanger. Modern oil filter modules are flow-optimized and thus help to increase the efficiency of the engine.

Reasons for failure and impact

Vibrations and temperature fluctuations lead to aging of plastic components. For example, a defective or improperly fitted cover gasket can lead to leaks and thus to oil losses. On the other hand, the use of unsuitable tools when dismantling or assembling the oil filter cover can irreversibly damage the module. Other causes of failure and thus reasons for replacement are a leaky or defective oil cooler and a defective thermostat in the oil filter module.

Program overview

MAHLE oil filter modules for the aftermarket	
OF 181/14 expected to be available beginning in May 2023	suitable for: VW / Audi / Porsche 3.0 I TDI (6-cylinder diesel)
OF 206/3 expected to be available beginning in August 2023	suitable for: AUDI / SEAT / SKODA / VW / MAN 1.6 I + 2.0 I TDI (4-cylinder diesel)