

MAHLE

SEVEN STRONG BRANDS— FOR YOUR SUCCESS

The MAHLE Aftermarket product range



WWW.MAHLE-AFTERMARKET.COM

THE MAHLE GROUP

MAHLE is a leading global development partner to the automotive industry. For several decades, we've been an innovator with products for the combustion engine and its peripherals. We offer our customers complete systems that stand out thanks to the unrivaled breadth and depth of our product range, and our products are found in every second road vehicle. And MAHLE is regularly in on the action on racetracks too—in Formula 1, the 24 Hours of Le Mans, or truck racing.

With 170 production locations, MAHLE is represented in 32 countries. At 16 major research and development centers in Germany, Great Britain, Luxembourg, Spain, Slovenia, the USA, Brazil, Japan, China, and India, 6,100 development engineers and technicians are working on innovative solutions for the mobility of the future.

We not only see megatrends such as population growth, urbanization, globalization, and climate protection as opportunities, but also as an obligation to design our technologies so that mobility is as environmentally friendly as possible.

THE MAHLE DUAL STRATEGY

Despite the rising importance of e-mobility, we believe that the internal combustion engine will remain the dominant drive for many years to come, which is why we're pursuing a dual

approach. On the one hand, we're working on new solutions to make the combustion engine more efficient and environmentally friendly, while developing highly efficient drive systems, power electronics, and electric auxiliaries for hybrid and electric vehicles on the other.

THE RIGHT RANGE EVERY TIME

You can rely on MAHLE as a strong partner for all mobility concepts. Take advantage of our expertise as a development leader as well as the comprehensive, ever-expanding MAHLE product portfolio and strong brands in the following areas:

- Engine components & turbochargers
- Filters
- Engine cooling & air conditioning
- Starter motors & alternators
- E-mobility & electronics
- Workshop equipment & diagnostics

ORIGINAL EQUIPMENT QUALITY EVERY TIME

No matter whether MAHLE manufactures products for automobile manufacturers or for trade—they always meet the same high standards. Our brands represent innovative strength and uncompromising quality. You can count on it.

BEHR[®]


BrainBee
WORKSHOP SOLUTIONS


CLEVITE[®]


IZUMI[®]


**KNECHT
FILTER**[®]


**METAL
LEVE**[®]

MAHLE[®]

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ENGINE COMPONENTS & TURBOCHARGERS: PISTONS

WE DELIVER PERFORMANCE— EVEN IN THE FAST WORLD OF FORMULA 1



“

The piston is a piece of metal that is absolutely essential to the operation of a combustion engine. It also serves to prevent engineers from becoming arrogant.

Ernst Mahle

PISTONS

They're constantly under fire, and their working conditions are getting tougher with each passing year. The thermal load (up to 2,600°C) and average peak cylinder pressures have increased, and the inertia force loads have also become greater as a result of high-speed concepts and the trend toward larger piston strokes. Demands are rising accordingly: reduced weight, lower oil consumption, and absolute safety—even in hot and cold load capacity testing and thermal shock endurance testing.

As a result, the overall height or compression height is continuously decreasing. The ECOFORM® pistons developed by MAHLE as new solutions save weight—the single-piece MONOTHERM® pistons, machined accordingly, weigh as little as those made of aluminum. And these, too, have been significantly refined—resulting in the aluminum piston with cooled ring carrier.

As a series manufacturer, MAHLE is committed to Formula 1 and benefits from the wealth of experience and expertise in this premium racing class.

As the world's largest manufacturer of pistons, MAHLE is intensively researching the products of tomorrow and already offers solutions for almost every engine today—quickly, reliably, and anywhere in the world. With our pistons, aftermarket customers receive original equipment engine components and thus the guarantee that comes with all our products: tried and tested under the most grueling conditions and proven in practice. A promise you can count on.



On the piston crown, you'll find the company or brand logo, the maximum piston diameter, the mounting clearance, and the installation direction according to the specifications of the relevant engine manufacturer.

Also a series manufacturer of pistons in Formula 1: MAHLE.

THE PERFECT PISTON— FOR EVERY APPLICATION

As the largest piston manufacturer worldwide, we offer a variety of product and material choices.

Our product portfolio comprises cast and electron beam-welded aluminum pistons, as well as composite pistons with aluminum, nodular cast-iron, and steel skirts. Composite pistons are screwed to piston crowns made of forged steel—a material that has been tried and tested with outstanding results. Not only are steel pistons delivered as bolted variants, they're also available as friction-welded or high-temperature brazed versions. The MAHLE piston range for large engines includes products with diameters of up to 580 mm.



ECOFORM® pistons with pivoted side cores

Weight-optimized pistons for passenger car gasoline engines. A special casting technology allows for a low weight with high structural rigidity.

→ APPLICATIONS:

*Railroad vehicles, special vehicles,
marine technology, oil and gas,
industrial engines*



**AUTOTHERMATIK®/
HYDROTHERMATIK®
pistons**

Pistons for highly loaded gasoline and diesel engines in passenger cars. Their cast-in, nonslotted steel strips give the piston a uniform body with greater strength.



**AUTOTHERMIK/
HYDROTHERMIK
pistons**

Very smooth-running pistons featuring cast-in steel strips for passenger car engines—the transition from the ring belt to the skirt area is slotted.



**Pistons with cooled
ring carriers**

The ring carrier and cooling channel are combined to form one system using a special process. This improves heat transfer at the first ring groove.



**Ring carrier pistons
with pin bore bushings**

Pistons for diesel engines with permanently fixed metallic ring carriers made of special cast iron for increased wear resistance, particularly in the first groove. Increased load capacity owing to pin bore bushings made of a special material.



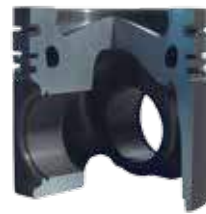
MONOTHERM® pistons

Single-piece, forged steel piston with an extremely high structural rigidity developed for modern combustion chambers with pressures of 250 bar and upward. With connected skirt and combined with a short piston pin, its weight is comparable to that of an aluminum piston.



**Ring carrier pistons with
cooling channel and
crown reinforcement**

For highly loaded diesel engines. A hard-anodized coating (HA coating) on the piston crown protects against cracks in the bowl rim or crown.



**Ring carrier pistons
with cooling channel**

For high operating temperatures. Intensive cooling of the piston crown and ring belt is achieved by circulating oil in the cooling channel.



Cast solid-skirt pistons

Cast solid-skirt piston with a long service life for gasoline and diesel engines. Piston crown, ring belt, and skirt form a robust unit. Range of application: model to large engines.



Forged solid-skirt pistons

Mainly for highly loaded series production and motorsports engines. The special manufacturing process increases their strength and is a prerequisite for smaller wall cross sections and reduced weight.



FERROTHERM® pistons

The steel piston crown is movably connected to the aluminum skirt via the piston pin. The high strength and low wear rate enable highly loaded diesel engines to comply with low exhaust gas and emissions limits.



Two-stroke pistons

Made of special aluminum alloys for the high mechanical and thermal loads in two-stroke engines.



**MonoWeld® pistons for
commercial vehicles**

The friction-welded steel piston is impressive thanks to its ability to withstand high thermal loads, making peak cylinder pressures over 230 bar possible. Its enclosed, rigid structure allows for improved cooling of the bowl rim because the walls can be made thinner. The connected skirt provides improved lateral support, thereby reducing cavitation propensity.

ENGINE COMPONENTS & TURBOCHARGERS: PISTON RING SETS

RELIABLE COMPONENTS— PERFECTLY COORDINATED



PISTON RING SETS

We're constantly improving the performance and running properties of our piston rings—with our state-of-the-art production facilities setting the benchmarks for quality. Decades of development and production guarantee an efficient interplay between pistons and piston rings for the highest demands:

- **Sealing off the combustion chamber from the crankcase**
- **Limiting and controlling oil consumption**
- **Dissipating the piston heat to the cooled cylinder bore**

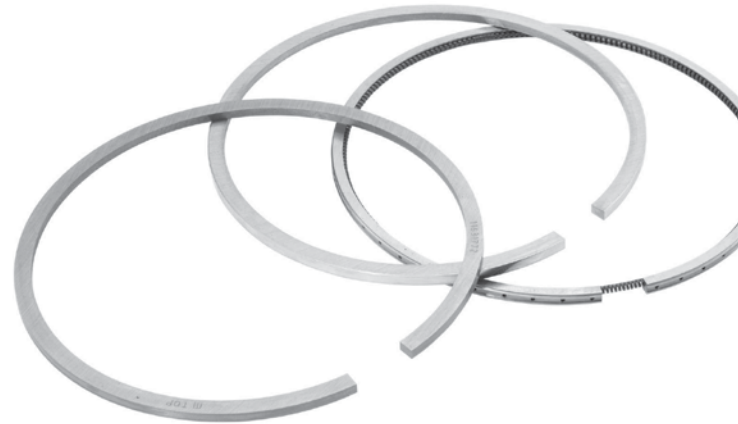
The circumference of the piston rings must fit tightly on the cylinder wall—even if the cylinder deviates slightly from its ideal shape. High inertia forces and combustion pressures, as well as severe wear stresses, place considerable demands on the material in terms of strength, surface quality, and shape.

THE IDEAL RING SET FOR EVERY PISTON

We provide piston ring sets for virtually all passenger car gasoline and diesel engines, as well as commercial vehicle diesel engines with diameters from 52 to 160 mm—in original equipment quality or specifically for older engines.

→ GOOD TO KNOW

MAHLE "N" piston ring set as installed in original equipment. By contrast, MAHLE "V" piston ring sets are specially designed for use in older engines.



Rings with TOP markings must be fitted with the markings facing upward (toward the piston crown).

EXCLUSIVELY HIGH-QUALITY MATERIALS

For normal to high stresses, materials with laminar graphite inclusions are used, while ultrahigh requirements call for gray cast-iron materials with embedded nodular graphite or steel materials.

RUNNING SURFACE COATINGS

To increase resistance to wear and scuffing, the running surfaces of the piston rings are coated (chromium or plasma spray coatings of metallic or ceramic materials).

ENGINE COMPONENTS & TURBOCHARGERS: CYLINDER LINERS

QUALITY BUILT TO LAST— PRECISE FIT AND LONG LIFE



CYLINDER LINERS

We're also constantly improving our cylinder surfaces. The precise matching of the honed cylinder liners with the pistons and piston rings (through optimized cast-iron surfaces) lowers oil consumption and reduces blowby, resulting in less wear, shorter run-in periods, and longer running times.

MAHLE produces cylinder liners for many international engine manufacturers—for both series production and the aftermarket and always according to the same strict quality standards for material, structure, and surface quality. Thanks to minimized production tolerances, the liners can be fitted precisely. We determine the alloy, the treatment of the melt, and the machining processes in close consultation with the engine manufacturers.

MATERIALS

In addition to aluminum, we use cast-iron alloy (gray cast iron alloyed with phosphorus) for cylinder liners. Additional alloy materials improve the wear properties, while the formation of bainite and very fine perlite strengthens the matrix.

HONING

Good honing reduces piston ring wear, particle emissions, oil consumption, and friction. Future improvements in honing will further shorten the run-in phase of the cylinder and improve the tribological properties. High material quality is a prerequisite for good, even honing of the cylinder bore (pore- and cavity-free cast materials with a homogeneous structure, uniform hardness, suitable for premachining the bore).



THE MOST IMPORTANT HONING METHODS BROKEN DOWN INTO THE INDIVIDUAL PROCESSING STEPS

Description	Honing process					Application
	Variant	1 st operation	2 nd operation	3 rd operation	4 th operation	
Normal honing	1	Diamond	Diamond			Series gasoline pass. cars Series diesel pass. cars Series comm. vehicles
	2	Diamond	Ceramic			
	3	Ceramic	Ceramic			
Plateau honing	1	Diamond	Diamond	Diamond		Series gasoline pass. cars Series diesel pass. cars Series comm. vehicles
	2	Diamond	Diamond	Diamond		
	3	Diamond	Ceramic	Ceramic		
Brush honing	1	Diamond	Diamond	Brushing		Series comm. vehicles/ pass. cars
	2	Diamond	Ceramic	Brushing		
Liquid honing		Diamond	Diamond	Liquid honing	Microfinishing	Series diesel pass. cars
Laser honing	1	Diamond	Laser structure	Ceramic	Ceramic	Testing/motorsports
	2	Diamond	Diamond/Ceramic	Laser structure		

→ HONING

Machining process in which the tool rotates while moving back and forth. This method makes it possible to achieve a cylinder form deviation of under 10 µm and an even surface roughness.

→ TRIBOLOGY

The science of friction, lubrication, and wear of interacting bodies in relative motion.

ENGINE COMPONENTS & TURBOCHARGERS: BEARINGS

RESILIENT AND ROBUST— FOR EVERY ENGINE TYPE



BEARINGS

In cooperation with engine manufacturers, we develop and test bearings for every single engine type. Ongoing fundamental research and development of materials and production technologies guarantee the highest quality—fatigue-resistant, adaptable, highly resilient, and resistant to wear and corrosion. We supply bearing shells, flanged bearings, bushings, and thrust washers with diameters from 27 to 140 mm, as well as bushings with diameters from 6 to 105 mm.

MATERIALS AND PRODUCTION METHODS

MAHLE uses a variety of high-quality aluminum and bronze alloys. Depending on the application, our bearings consist of a high-strength steel support shell and are coated with several different bearing metals—the material properties complement each other perfectly. We use various coating methods, depending on the relative bearing load.



Solid bearings
 Made completely from a special bearing metal alloy.



Two-component bearings
 For low to medium loads in gasoline and naturally aspirated diesel engines in passenger cars—consisting of a steel support shell, an intermediate layer, and a layer of bearing metal (mainly aluminum alloys).



Three-component bearings
 Built from a steel support shell, bearing layer, barrier layer, and an overlay—for use in highly loaded engines. Their performance is improved by “sputtering,” which increases hardness, load capacity, and wear resistance. Sputter bearings are intended for super-charged engines with charge air cooling and are also increasingly found in passenger car diesel engines.

→ SPUTTERING

Coating method that works on the principle of cathode atomization, in which atoms are knocked out from a metal cathode by the impacting ions from a gas discharge process. The resulting atomized metal condenses on the running surface of the bearing shell as a uniform layer.

ENGINE COMPONENTS & TURBOCHARGERS: VALVE TRAIN COMPONENTS

QUALITY AND SAFETY— KILOMETER AFTER KILOMETER



VALVE TRAIN COMPONENTS

Valves form a closed system together with valve seat inserts and valve guides, which has to withstand ultrahigh stresses. For that reason, our product range includes not only valves but also their tribological partners: valve seat inserts and valve guides. The combined development of these components in one system brings considerable advantages in terms of minimizing wear and increasing economic efficiency.

ALL TYPES OF VALVES

Worldwide, MAHLE produces valves of diverse designs and types for passenger cars and commercial vehicles—with stem diameters from 5 to 12 mm and valve lengths from 80 to 210 mm. Extensive technical expertise, high productivity, and outstanding quality have made MAHLE one of the most important valve manufacturers on the international market.

In large-scale production, we employ state-of-the-art technologies: plasma powder methods in blank

production or high-speed grinding processes for mechanical finishing. Different materials are used depending on the purpose and our valves are reinforced around the seat, hardened, nitrided, or chrome-plated. Our range also includes sodium-filled hollow valves (maximum heat dissipation) for extreme applications.

VALVE GUIDES AND VALVE SEAT INSERTS

Valve guides center the valve on the valve seat and compensate for the lateral forces acting on the valve stem. They also dissipate heat to the cylinder head. Depending on the design, identical or different valve guides are used for the intake and exhaust sides. The range of materials extends from gray cast iron and brass to various alloys of sintered materials. The valve seat insert together with the valve seals the combustion chamber against pressure loss, and also transfers heat and prevents the valves from impacting the softer cylinder head material. Valve seat inserts are predominantly made from chromium-steel alloys or sintered materials.

→ **TRIBOLOGY**
The science of friction, lubrication, and wear of interacting bodies in relative motion.

Materials

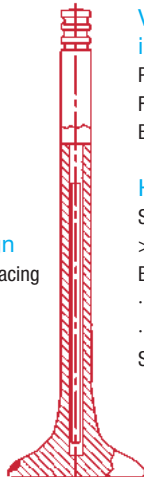
Austenitic steels
Martensitic steels

Types

Monometallic valves
Bimetallic valves

Valve seat design

Plasma powder hard-facing
Induction hardening



Valve base induction hardening

Profile hardening
Full hardening
Base surface hardening

Hollow valves

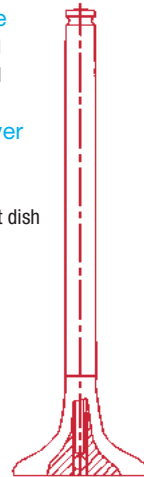
Stem diameter:
> 6 mm
Bore sealing:
· Laser welding
· Friction welding
Sodium-filled

Fillet profile

Turned, ground
Contour-forged

Dished cover

Machined
Forged
With or without dish



Valve base geometry

1–3 grooves
Special designs

Valve length

80–210 mm

Valve disk diameter

18–65 mm

Stem diameter

5–12 mm

Surface treatment

Salt bath-nitrided
Hard chrome-plated
(coating thickness: 3–35 µm)

Our valves are designed for a wide variety of applications in order to withstand extreme mechanical, chemical, and thermal loads, and to ensure optimal heat dissipation.

ENGINE COMPONENTS & TURBOCHARGERS: TURBOCHARGERS

REDUCING EMISSIONS— DELIVERING MORE PERFORMANCE



TURBOCHARGERS

Exhaust gas turbochargers are a key technology for increasing performance and reducing fuel consumption and emissions. MAHLE is a long-standing business partner to international automobile and engine manufacturers in the development and production of highly loaded turbocharger components.

Turbochargers are recording strong growth rates in the automotive spare parts business. Highly efficient turbochargers are available to the aftermarket under the MAHLE brand. We cover around 70 percent of all fast-moving applications in the commercial vehicle sector—and around 95 percent of MAHLE passenger car turbochargers (Volkswagen, Renault, BMW, and Mercedes-Benz) since 2012. Our range is constantly being expanded and a corresponding mounting kit is either already available or in preparation for virtually every turbocharger.

ORIGINAL EQUIPMENT TECHNOLOGIES FOR THE AFTERMARKET

Nearly every diesel vehicle produced in Europe, North America, and Japan features turbocharging technology—and its use in passenger car gasoline engines is increasing worldwide. In order to drive this technology forward, Robert Bosch GmbH and MAHLE GmbH formed the joint venture Bosch Mahle Turbo Systems (BMTS) in 2008.

CUTTING-EDGE QUALITY THROUGH INTEGRATED DEVELOPMENT AND MANUFACTURING PROCESSES

The highest level of development and manufacturing expertise is needed to ensure high efficiencies over a broad operating map area at engine speeds well above 300,000 rpm and exhaust gas temperatures in excess of 1,000°C. MAHLE therefore employs the latest simulation tools in the initial phase of its integrated development process to guarantee the thermodynamic and thermomechanical properties.

MAHLE turbochargers are manufactured in line with defined standards, using the latest processes in state-of-the-art facilities across the group.

- **High-speed compressor wheel machining— for greater balance accuracy, optimized speed stability, and reduced running noises**
- **Double piston rings on the rotor shaft—for lower oil consumption and fewer foreign particles**
- **Turbine housings made of high-tech materials—for greater thermal stability and durability**
- **Functionally process-controlled central housings and progressive balancing of the rotor shaft—for improved mileage and less noise**
- **Electron beam-welded rotor shaft and wheels guarantee high strength**



FILTERS

OUR FILTER RANGE— A CLEAN SOLUTION



FILTERS

Our filter media range consists of specially treated papers, fleeces, or multilayer filter media, depending on the specification and application.

FILTERS MADE OF PAPER

MAHLE paper filters are made of high-quality cellulose fibers impregnated with special resins for use in air, fuel, oil, and hydraulic filters. Preheating prepares the paper for embossing of vertical ridges. The paper is then pleated and impregnated according to the respective requirements—the precipitation heat treatment makes the paper mechanically stable and resistant to chemical and thermal influences. The stable pleat geometry prevents blocks from forming even under high loads and ensures that air, oil, or fuel can flow freely at all times. The filter rating can reach as low as 1 µm, depending on the requirements.

FILTER FLEECES

Plastic fibers with thicknesses in the µm range provide the basic material for fleeces—the finer the fiber, the better the retention. The fleeces are applied in layers, whereby the fineness of the fibers and the fleece density increase from the dirty to the clean side. This funnel effect allows retention efficiencies of up to 99.9 percent with low flow resistance.

Fleeces have proven themselves in cabin air filters and their use in oil and air filters is steadily increasing. Filter performance is increased by up to 40 percent—prolonging service life at the same time. In fuel filters, fleeces are usually used in conjunction with a stabilizing base paper.

MULTILAYER FILTER MEDIA

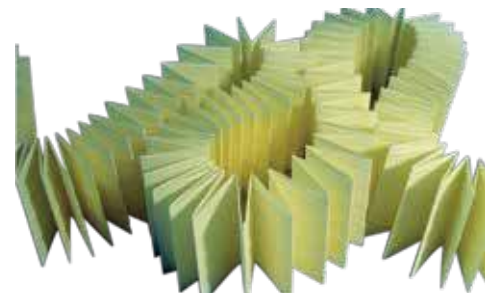
Compared with conventional paper filters, the combination of fleece and paper has an absorption capacity that is up to 40 percent higher—with an ability to filter particles of 3 to 5 µm. Multilayer filter media are predominantly installed in modern diesel fuel injection systems.



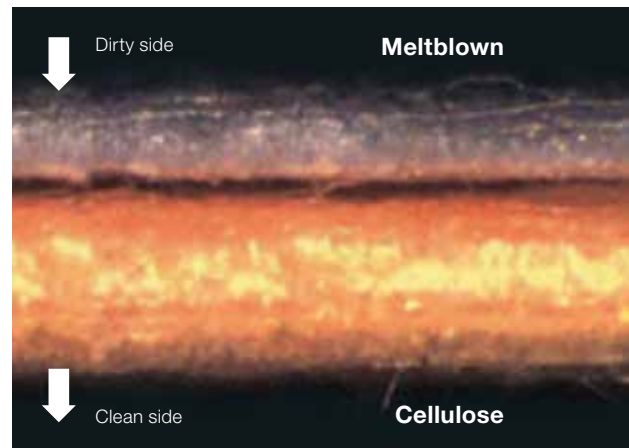
The impregnated cellulose fibers under a microscope.



Filter paper after embossing.



Ready-pleated paper for use in filters.



Multilayer filter medium with plastic fleece on the dirty side and paper on the clean side.

Block formation in air filters

If the pleat geometry isn't stable, the pleats lie together too closely so that little or no air can flow through the filter in these areas. This increases flow resistance, reduces filtration and service life, and increases fuel consumption and emissions.

AIR FILTERS

Clean intake air is essential for optimal engine output. MAHLE air filters keep out up to 99.9 percent of dust, soot, and tire particles, and contribute to an optimal air–fuel mixture. The high particle retention capacity ensures a long service life—even under extreme conditions such as heat, cold, or chemical influences. It also prevents premature wear of the valves, cylinder surfaces, piston rings, bearings, and other engine components. To ensure perfect filter performance, all filters must be replaced within the intervals prescribed by the automobile manufacturer.

In passenger cars, round and panel elements are fitted in air filter housings mounted to the engine or chassis and are stabilized with glue beads on the dirty side and reinforcing grids on the clean side, in accordance with the specifications. For dusty environments, an additional prefilter (foam mat) is installed on the dirty side. Metal or plastic support studs counteract higher surface loads.

In commercial vehicles, robust, weight-optimized air filter systems made of recyclable plastic are used. These also reduce suction noise and, in order to achieve a large filter surface with high stability, are normally cylindrical in shape—optimized by radial seals and axial supports. Additional safety elements (special fleece cylinders) protect the clean side during maintenance and replacement.

Our air filters are completely sealed

Unclean air in the intake section contaminates the air flow mass meter and distorts its results—which disrupts fuel injection and causes wear. To prevent this bypass air, we ensure that our filter elements fit exactly and that the gaskets are carefully selected. PUR gaskets made from specially developed PU foam ensure continuous sealing between the dirty and clean sides. They're resistant to aging, chemical influences, and temperature. Their flexibility is precisely defined to perfectly fit the sealing geometry.



CABIN AIR FILTERS

During one single hour of driving, a volume of up to 100,000 L of air is blown into the cabin. If the cabin air filter becomes clogged or even fails, the pollutant concentration in the passenger compartment can increase to up to six times that of the outside air. MAHLE therefore recommends replacing the filters every 15,000 km or at least once a year.

MAHLE cabin air filters reliably supply the driver and passengers with cleaned air to breathe, thus safeguarding their health, well-being, and power of concentration even in the event of smog or a high pollen count. They also reduce the load on the blower, protect the heating, air conditioning system, and cabin from contamination, and prevent the windows from fogging.

The advantages of our cabin air filters' pleat geometry:

- Long service life
- Low flow resistance minimizes the load on the blower
- The accurate fit eliminates bypass air

What's more, our cabin air filters don't produce harmful vapors as they're manufactured using solvent-free methods.

CABIN AIR FILTERS WITH ACTIVATED CARBON (LAK)

This type keeps out harmful exhaust gases, dirt, dust, and high ozone concentrations, and minimizes odors. The paper block used in these filters is embedded in two layers of fleece. Depending on the vehicle type, pure activated carbon filters (LKK) are also available, which can be used to supplement conventional cabin air filters.

CareMetix® (LAO) WITH S5 BROADBAND

TECHNOLOGY: FIVE LAYERS PROVIDE FIVE-FOLD PROTECTION—AND ALSO FILTER OUT ODORS!

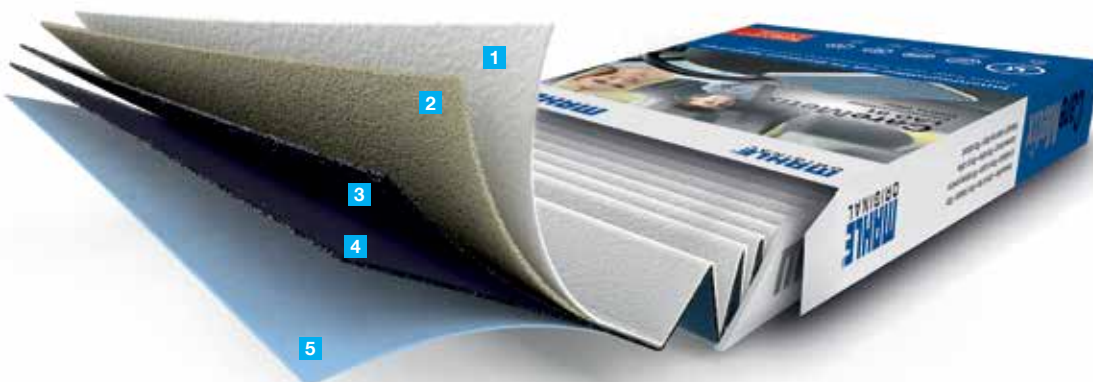
When you're on the road, you need clean air to focus and drive safely—and to feel good. But the air we breathe is often polluted with harmful, allergenic substances and odors that conventional filters can't eliminate. The solution: **CareMetix®** with S5 broadband technology— five layers provide five-fold protection.

CareMetix®: five layers for total well-being

- 1 High-performance particulate filter layer
- 2 Molecular layer
- 3 Engineered activated carbon layer
- 4 Biofunctional layer with activated carbon
- 5 Protective layer



In vehicles with a higher mileage or those operated in heavily polluted surroundings, an additional prefilter (LAP) made of polyester foams or fleece matting is frequently used, which prevents the cabin air filter from becoming prematurely clogged—thus considerably extending the service life of our LA/LAK filters.



→ CareMetix®

-  Protection against odors before they develop
-  Protection against pollen
-  Protection against soot and fine particulates
-  Protection against mold
-  Protection against bacteria

OIL FILTERS

Engine oil is permanently contaminated—combustion residues, dust, oil carbon, soot, abrasion particles, and condensates accelerate the wear of the engine components. Clean engine oil reduces friction, cools the engine parts, protects against corrosion, and seals the combustion chamber.

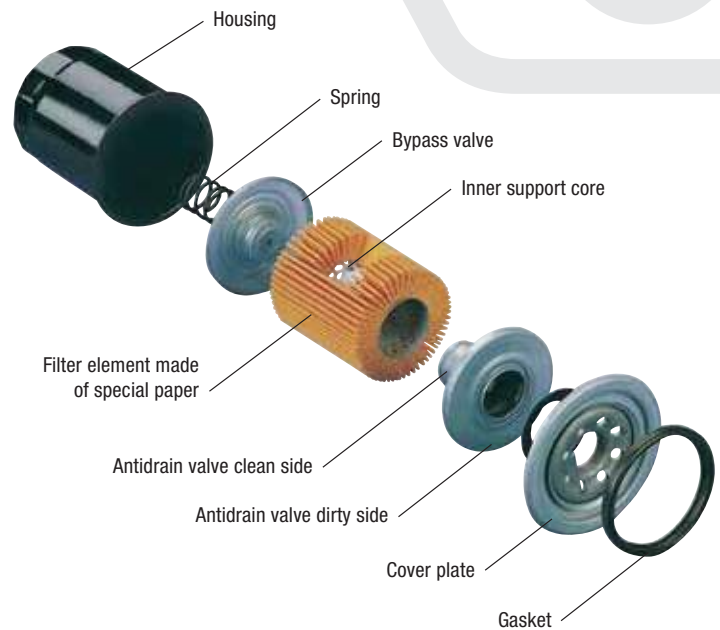
MAHLE oil filters reliably keep out the dirt particles. The stable pleat geometry assures cold-start stability—peak loads of up to 20 bar are compensated by the high pressure resistance of the housing.

A pressure-relief valve guarantees the oil supply under all conditions—during cold-start phases, at low outside temperatures, and even when a filter element is badly clogged. An antidrain valve prevents the emptying of the filter when the engine is switched off and secures fast oil supply when the engine is started. High-grade sealing materials and custom-fit connecting pieces guarantee a reliable separation between contaminated and filtered oil.

In order for the oil filter to function correctly, however, it must be replaced promptly in accordance with the maintenance intervals prescribed by the automobile manufacturer.



The MAHLE oil filter module for commercial vehicles is highly integrated on both the oil and coolant side. As a result, it has fewer interfaces and sealing points—high-performance plastics reduce both weight and costs.



More efficient replacement: oil change filters

OC oil change filters can be replaced with ease: the deep-drawn sheet steel housing with powdered coating has a multifaced collar to facilitate quick release. The cover plate has a thread for the screw-on spigot and a groove for the gasket—the filter element features an inner core as support against the oil pressure that is directed from the outside to the inside.

→ OIL FILTER INSERTS

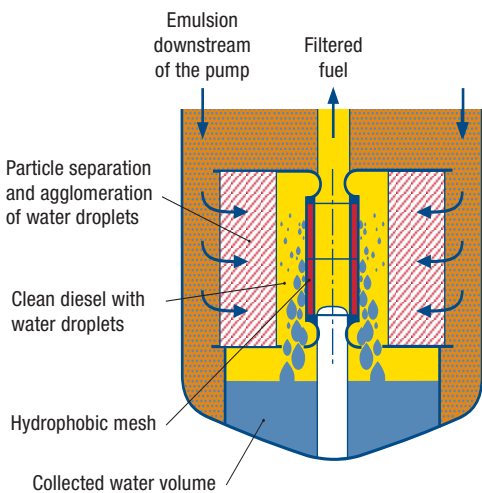
With filter inserts from the OX and OX-Eco range, we offer particularly economical solutions for workshops: instead of replacing the complete filter, only the clogged filter element needs to be changed—a solution that makes ecological sense and saves material and disposal costs. In the OX-Eco version, the inserts are metal-free and therefore fully incinerable. Oil filter inserts are available for all oil filters with housings that can be split.

FUEL FILTERS



New and innovative

MAHLE has developed a special fuel filter module for commercial vehicle applications. The patented multistage filter element provides effective water separation. In the first stage, the solid particles are filtered out. Then—in subsequent stages—the microfine droplets coalesce to form larger droplets and the water is separated.



Schematic diagram of a two-stage filter with integrated water separator.

MAHLE fuel filters retain foreign objects reliably. High-quality filter media protect against the smallest dirt particles, and therefore against corrosion. This safeguards the engine function and ensures efficient operation. The constant fuel supply required is achieved through pressure regulation and the recirculation of surplus fuel from the injection pump to the tank—pulsation damping compensates for the pressure fluctuations caused by the fuel pump.

MAHLE fuel filters comply fully with the high safety standards of the automobile manufacturers and ensure leak tightness even in the event of accidents. For the fuel filter to function correctly, it must be replaced regularly in accordance with the intervals prescribed by the automobile manufacturer.

DIESEL FUEL FILTERS

In order to prevent paraffin separation and gelling at low ambient temperatures, our fuel filters rely on preheating with electric heating elements or the recirculation of fuel that has been warmed by the engine. Newer filter systems also separate water efficiently—if diesel fuel contains water, corrosion and cavitation damage may occur in the injection system.

Water separation is carried out in two phases:

- **Phase 1: alongside the actual particle filtration, fine water droplets are also coalesced to form larger ones.**
- **Phase 2: a water separation stage (hydrophobic fabric) prevents these larger water droplets from entering the clean fuel.**

Spin-on fuel filters

Simply screwed on to the filter head thread adapter. Mounted elastomer gaskets ensure leak tightness between head and filter.

Inline fuel filters

These are made from sheet steel with corrosion protection, stainless steel, aluminum, or plastic and are mounted in the fuel line. Optional functions such as pressure regulation, reheating, and water separation are available.

Fuel filter elements

In filter housings that can be opened, only the filter elements are replaced in the service. The housing remains on the engine. This saves material costs and conserves resources.

AIR DRIER CARTRIDGES

Air drier cartridges from MAHLE – for uninterrupted operation of compressed air safety systems

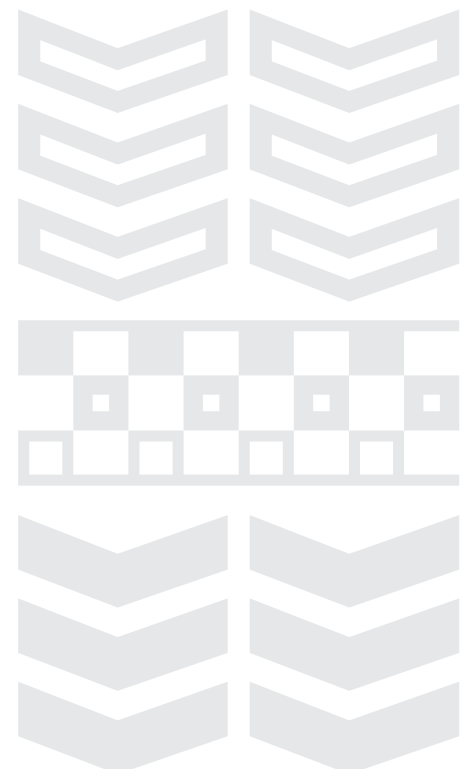
ESPECIALLY FOR COMMERCIAL VEHICLES

Many control and closed-loop control processes in commercial vehicles work using compressed air, as is the case in brake systems. If the air still contains moisture, this can cause damage in lines and reservoirs. Freezing may occur if the lubrication films become watered down. To prevent this from happening, air driers remove the moisture. As safety-relevant components, it's imperative that air driers be replaced according to the manufacturer specifications.

Air drier cartridges from MAHLE operate irrespective of the temperature. They contain a drying agent that is regenerated under system control—at the same time, contamination from the prefilter and condensation water is removed. MAHLE air drier cartridges are resistant to corrosion on both the inside and the outside, and work reliably even under the most difficult of conditions.

MATERIALS: FOR THE SAFETY OF PEOPLE, ENGINES, AND THE ENVIRONMENT – ONLY THE BEST

The shell of the air drier cartridge is made of robust steel or polyethylene (PE). It has a pressed-in thread on the front end and can thus be threaded onto the head. What's outstanding about this cartridge is its contents: it consists of granulate or silicone beads of only 1 to 3 mm in size, depending on the application and vehicle type. The materials are extremely porous. The entire surface is designed to capture and then release moisture unbelievably quickly. In this way, it becomes active immediately when the air flows past from the compressor or from the separate reservoir, and it always regenerates itself autonomously. Oil separators (coalescers) are sometimes integrated in the air drier cartridges in order to increase service life.



UREA FILTERS

Nitrogen oxides (NO_x) contribute to the formation of smog and acid rain as well as exacerbating the greenhouse effect. In order to reduce emissions, AUS 32 (a 32.5% urea solution) is used. AUS 32 is aqueous, clear, nontoxic, safe to handle, and doesn't present a risk to people or the environment. AUS 2 is sold at service stations or by accessory suppliers under the following trademarks: AdBlue in Europe, DEF in North America, and ARLA 32 in Brazil. Its consumption is around 5 percent of a vehicle's fuel consumption.

By using AUS 32, it's possible to comply with the increasingly stringent Euro 6 and Tier 2 Bin 5 (United States) statutory limits and beyond. This method of exhaust gas purification is technically complex and transforms the nitrogen oxides into harmless nitrogen (N₂) and water (H₂O) by means of selective catalytic reduction (SCR).

SCR SYSTEM

By means of injection nozzles, the urea solution is sprayed in a controlled manner from a separate tank into the exhaust gas flow—directly upstream of the SCR catalytic converter.

The hot exhaust gases decompose the urea solution to form ammonia and isocyanic acid (thermolysis). The water contained in the solution breaks down the isocyanic acid into ammonia and carbon dioxide (hydrolysis). The nitrogen oxides present in the exhaust gas system then react with the ammonia in the catalytic converter, where they're converted into harmless nitrogen and water vapor.

THE PROBLEM OF CONTAMINATION—THE SOLUTION FROM MAHLE

More and more manufacturers are using SCR systems, and the demand for urea solution is rising. Increasingly complex storage and transport processes are inevitably raising the risk of contamination, with the danger that sensitive components (injection nozzles, catalytic converters, other system components) become dirty, wear out, or break down completely.

In order to prevent this, MAHLE Aftermarket offers urea filters in proven original equipment quality. Their fine-pored filter media guarantee the proper, long-term operation of SCR systems.

→ WELL EQUIPPED FOR THE FUTURE

MAHLE is closely involved in the ongoing development of these components and already offers innovative, future-oriented solutions—such as a fully synthetic filter medium with extreme temperature resistance. It can withstand more than 1,000 freeze cycles without damage, while maintaining consistently high filter performance.

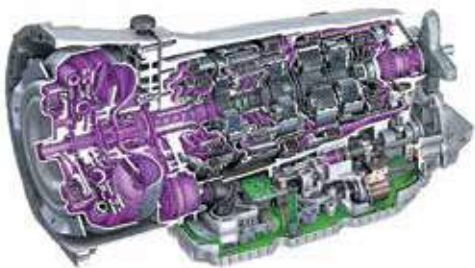


TRANSMISSION OIL FILTERS

FOR A LONGER TRANSMISSION LIFE

Just like all operating media in the vehicle, the transmission oil is subject to aging and wear. At extremely high temperatures—caused by sporty driving or towing a trailer, for example—automatic transmission oil can age faster than under normal conditions. To prolong the life of increasingly complex automatic transmissions and ensure they operate smoothly,

Comparison of oil change methods



■ Static oil change

■+■ Dynamic oil change

→ GOOD TO KNOW!

Nearly **90%** of all automatic transmissions on the market are compatible with the MAHLE FluidPRO® ATX 180.

The global production of vehicles with automatic transmissions has grown by around **40%** in the last five years.

Changing the transmission oil every **60,000 km** or every **4 years** prolongs the service life of complex automatic transmissions and ensures optimal shifting behavior.

many vehicle manufacturers are changing their guidelines on transmission oil—moving away from a strategy of filling up to last throughout the service life toward changing it regularly or as needed.

SIMPLY BETTER: DYNAMIC OIL CHANGE

In a conventional, or static, oil change, approximately 30 to 50 percent of transmission oil is replaced, and new oil is mixed with old oil in the process. By contrast, up to 100 percent of the oil is replaced in a dynamic transmission oil change performed with the MAHLE FluidPRO® flushing unit.

Benefits for motorists:

- **Avoids transmission repair costs**
- **Significantly improves transmission shifting performance**
- **Eliminates minor transmission malfunctions (such as jerking or poor start-up behavior)**
- **Extends transmission mileage**

MAHLE FluidPRO®

The FluidPRO® ATX 180, ATX-2, and ATX-3 transmission flushing units perform the dynamic oil change fully automatically—without the need for any manual intervention.

The FluidPRO® ATX 180 replaces up to 100 percent of the oil in just one cycle. But the unit also boasts countless other beneficial features, including a service time of just 5 to 10 minutes and numerous adapter sets covering around 90 percent of commercially available automatic transmissions.

MAHLE TRANSMISSION OIL FILTERS

Our transmission oil filters remove abrasion particles from the transmission and provide effective protection against damage. MAHLE already offers suitable solutions for many popular car brands and vehicle types. And our range will continue to expand in the future.



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MAHLE offers the complete range of filters—in original equipment quality. They're all highly effective at protecting people, engines, and the environment. What's more: innovative products, such as the fully incinerable ecological oil filter, are constantly being added to the product range. And these filters too are manufactured in original equipment quality.



ENGINE COOLING & AIR CONDITIONING: THERMOSTATS

OPTIMAL OPERATING TEMPERATURE— INTELLIGENTLY CONTROLLED



→ WEAR-FREE, BUT STILL A REVENUE MAINSTAY

When carrying out any work that requires access to the cooling system (whether following an accident or as part of repair or maintenance work), the temperature manager should always be replaced at the same time for safety reasons—because a defective thermostat can cause engine damage due to overheating or undercooling.

THERMOSTATS

To achieve optimal efficiency, a combustion engine requires the temperature level to remain as constant as possible. This is ensured through the use of thermostats, which regulate the engine temperature with coolant.

MAHLE Aftermarket offers a variety of thermostats and components for temperature regulation:

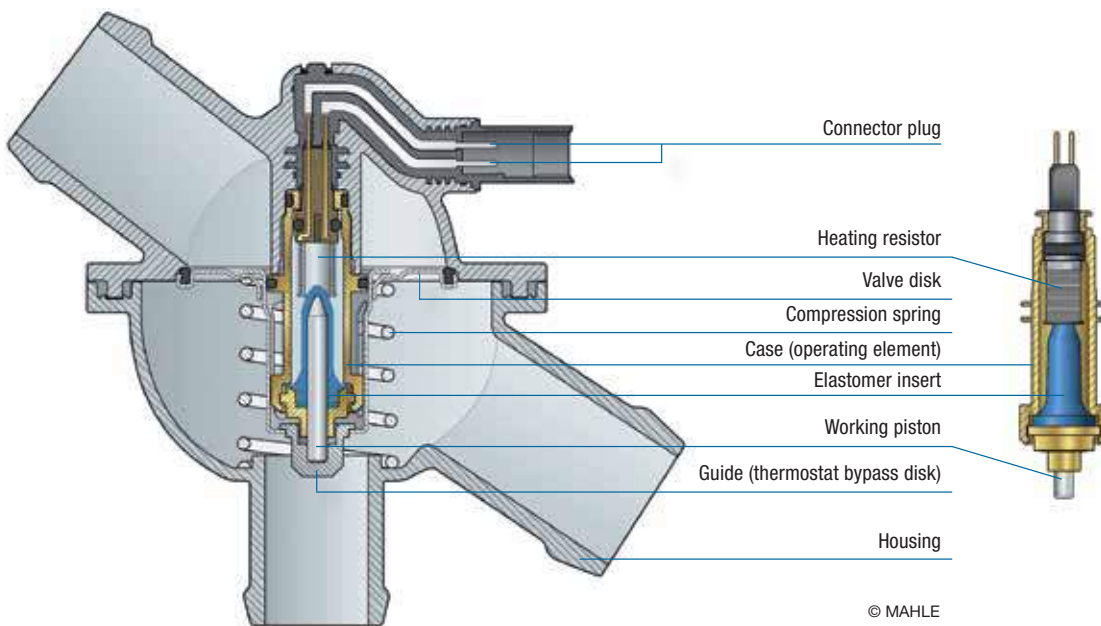
- **Thermostat inserts; integrated, housing, and sleeve valve thermostats; and map-controlled thermostats**
- **EGR thermostats**
- **Oil thermostats**
- **Thermocouples and thermal switches**

MAP-CONTROLLED THERMOSTATS—THE MOST EFFECTIVE THERMOSTATS IN THE COOLING CIRCUIT

Map-controlled thermostats increase engine efficiency because an electrical heating resistor is additionally integrated in the operating element's wax, which is electrically activated via the control unit and therefore reacts considerably more quickly to changing load cases and operating conditions.

This load-dependent temperature regulation has the following advantages:

- **Optimal combustion**
- **Lower fuel consumption**
- **Fewer pollutant emissions**
- **Longer engine service life**
- **Higher performance**
- **Greater comfort**



Cross section of a map-controlled thermostat with electrical connections and heating resistor integrated in the wax element.

ENGINE COOLING & AIR CONDITIONING: AIR CONDITIONING COMPRESSORS

EXCEPTIONALLY RELIABLE— FOR AN OPTIMAL CLIMATE



“

The air conditioning compressor is the heart of vehicle air conditioning. It compresses and circulates the refrigerant and ensures that the optimal temperature is maintained in the cabin.

AIR CONDITIONING COMPRESSORS

THE AUTOMOTIVE INDUSTRY NOT ONLY DEPENDS ON US, IT GROWS WITH US TOO

As a competent technology partner for all the leading OE manufacturers, the MAHLE Group has many years of expertise in vehicle cooling and air conditioning.

This know-how feeds directly into the products and services of MAHLE Aftermarket and ensures spare parts dealers and workshops have efficient access to the thermal management competence they need. Services include professional customer support and consulting in vehicle air conditioning systems.

FOR A BROAD SPECTRUM OF REQUIREMENTS AND SPECIFICATIONS—ALWAYS THE RIGHT SOLUTION

We deliver the right solution to our customers to meet a broad range of needs and demands. In addition to our standard offer, our premium range includes air conditioning compressors designed to meet the highest performance and quality standards. Our portfolio already covers all the top applications for passenger cars and trucks, and the constant expansion of our market- and customer-focused product range means our partners are able to work profitably—now and in the future.

MORE THAN JUST COLD AIR

The air conditioning compressor is the heart of vehicle air conditioning and makes sure there's a pleasant atmosphere in the passenger cabin. Typically, compressors can be divided into two groups.

COMPRESSORS WITH A FIXED AND A VARIABLE DISPLACEMENT

In contrast to compressors with a fixed displacement, variable compressors adjust their pump capacity to suit the requirements of the air conditioning. Therefore, unlike the fixed compressor, the engine doesn't jerk when constantly engaging and disengaging, fuel consumption drops and service life increases thanks to the continuous circulation of oil.



	Low budget	Reman	IAM basic	IAM standard	Premium range
Cooling performance	■	■	■	■	■
Durability and reliability	■	■	■	■	■
Comfort and driving experience	■	■	■	■	■
Support and service	■	■	■	■	

■ = AVAILABLE - -> +

MAHLE offers a strong and comprehensive range of air conditioning compressors. Our standard range covers all the top applications for the Europe, Middle East, and Africa sales regions.



STARTER MOTORS & ALTERNATORS

POWERFUL AND EFFICIENT— FOR THE PERFECT START



→ EXPERTISE IN THE BEST TRADITION

Used in passenger cars, commercial vehicles, agricultural and construction machinery, golf carts, and boats: our starter motors, alternators, electric drives, and controllers are backed by more than 50 years of experience and knowledge.

STARTER MOTORS & ALTERNATORS

All mechatronics products are equipped with a counterfeit-proof VeoMark® security label. The range includes around 700 starter motors, well over 700 alternators, more than 400 electric drive motors, and almost 5,000 spare parts at present—and is constantly being expanded.

STARTER MOTORS AND ALTERNATORS

We already have the right product for a large number of vehicle applications from all renowned OE manufacturers—our coverage includes more than 50 percent of starter motors and more than 44 percent of alternators. Thanks to ongoing development, we're striving for a total coverage of over 80 percent in Europe.

ELECTRIC DRIVES AND CONTROLLERS

To meet the growing demand in this segment—triggered by the increasing electrification of vehicles and equipment—we offer a wide range of electric motors and controllers for passenger cars, commercial vehicles, forklifts, industrial vehicles, sweepers, pallet trucks, golf carts, and passenger bus air conditioning. These products are presented in detail in a separate catalog.

Regularly the number one choice—for good reason.

- We only supply original equipment quality.
- You'll always receive brand-new products from us. Serviced or refurbished components are not an option.
- With our products, you can count on a long service life, ease of maintenance, and a high degree of functionality. Because they're resistant to salt, water, and dust, and insensitive to vibrations, low temperatures, and other weather factors, our products are suitable for use in the heavy-duty and commercial vehicle industry.
- Our compact design allows space for new developments and a variety of applications.
- All our components are electromagnetically compatible and fulfill international standards.
- We employ sustainable manufacturing practices and use resources wisely.



E-MOBILITY & ELECTRONICS: CONTROL & POWER ELECTRONICS

INNOVATIVE SOLUTIONS— FOR THE MOBILITY OF THE FUTURE



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*Take advantage of an even bigger product range
from a single source—for all mobility solutions.*

CONTROL & POWER ELECTRONICS

A new addition to the MAHLE product portfolio is Nagares—a Spanish electronics specialist. With this acquisition, MAHLE is strengthening its competence in products for the e-mobility sector and is now in a position to offer systems solutions across the broad product portfolio of electric drives, auxiliary components, and thermal management.

Its portfolio includes the following products:

- **Actuators and switches**
- **Electronics products, such as diesel glow plugs and low-voltage motor controllers, acoustic warning signal controllers, and electronic battery disconnects**
- **High-performance electronics like DC/DC converters**
- **Various sensors**

Greater added value for trade and workshops:

- **Global MAHLE network with a personal contact on site**
- **An even bigger product range from a single source—for all mobility solutions**
- **Comprehensive technical support from the MAHLE Aftermarket product specialists**
- **Knowledge transfer at MAHLE Aftermarket product training sessions**

Even more benefits:

- **Control and power electronics for passenger cars and commercial vehicles in uncompromising original equipment quality from MAHLE Nagares**
- **Many years of expertise in vehicle electronics development and manufacturing in the new Electronics product group**
- **Access to the expanded product range, which now includes groundbreaking electronics applications and is constantly adjusted to market requirements**



Actuators and switches



Electronics



Sensors



High-performance electronics

WORKSHOP EQUIPMENT & DIAGNOSTICS: A/C SERVICE UNITS

EFFICIENT SOLUTIONS— FOR MAINTENANCE AND SERVICE

MAHLE Aftermarket developed the ArcticPRO® product line with E³ technology for an efficient, ecological, and economical A/C service. From the basic/lightweight model to entry-level, professional, and premium solutions, we offer the ideal products for every requirement.

ADVANTAGES AT A GLANCE

Efficient and innovative—our line of ArcticPRO® A/C service units

- ✓ **Efficient and successful servicing, regardless** of the vehicle and ambient temperature
- ✓ **USB interface, Wi-Fi, Bluetooth** for remote diagnostics, software updates, and ASA connectivity
- ✓ Suitable for: **passenger cars as well as commercial, off-road, agricultural, and hybrid vehicles**
- ✓ **LED light** indicates status anywhere in the workshop
- ✓ **Remote control** via a smartphone/tablet app (iOS and Android)
- ✓ **Ergonomic design:** handle to open front of the unit



The EGEA label

It stands for the quality and functionality of professional workshop equipment products. A device that has been developed and designed in accordance with the EGEA specification fulfills all legal requirements and safety standards.

The label certifies that MAHLE develops high-quality and effective service units for workshops. Many of our A/C service units for R1234yf carry this label.

A/C SERVICE UNITS

The new generation of A/C service units from MAHLE are cutting edge when it comes to connectivity and ease of maintenance—with Bluetooth and Wi-Fi, a large touch screen, a status monitoring app, and remote service.

Our new devices boast impressive, comprehensive connectivity. They all connect to our server and receive permanent, automatic software updates. Their ergonomic design and intuitive user interface are state of the art. With one-handed operation of the maintenance flap, we're setting entirely new standards. All new-generation A/C service units are already convertible to the refrigerant R513a and designed for integration in the ASA network. The 7" touch screen guides the mechanic simply and safety through all the steps necessary in the A/C service. Our professional and premium devices can be controlled and monitored via an app. We also offer an efficient, Europe-wide service network with technical support, machine introductions, and training.

ALWAYS PRESENT IN ALL OUR UNITS: MAHLE'S A/C FORMULA

E³ = ECOLOGICAL × ECONOMICAL × EFFICIENT

E³ – FILL: Always ready for use, regardless of the vehicle and ambient temperature.

E³ – CONNECT: Complete recovery of refrigerant from hoses and couplings.

E³ – PUMP: The internal cleansing process for the vacuum pump significantly extends oil change intervals. Up to 1,000 operating hours. **Benefit: Significantly reduced maintenance costs.**

Overview of all available ACX units

Refrigerant R134a

Basic/lightweight	ArcticPRO® ACX 110
Entry-level	ArcticPRO® ACX 320
Professional	ArcticPRO® ACX 350
Premium	ArcticPRO® ACX 380

Refrigerant R1234yf

Basic/lightweight	ArcticPRO® ACX 210
Entry-level	ArcticPRO® ACX 420
Professional	ArcticPRO® ACX 450
Premium	ArcticPRO® ACX 255
Premium	ArcticPRO® ACX 480

Remote diagnostics and service support

MAHLE A/C service and transmission flushing units are easy to operate and extremely reliable. Should there be any problems, however, our remote diagnostics service offers fast assistance.



ACX AND ATX MANAGER

Remote diagnostics and service support: anytime and anywhere

- Immediate assistance when you need it—on site without a technician
- A/C service unit connects simply to your PC via USB or Wi-Fi
- Your workshop service partner can control the service unit and individual components or correct defects remotely, without an on-site visit
- For MAHLE A/C service units ArcticPRO® and MAHLE FluidPRO®

REMOTE SERVICE

A function of the ACX and ATX Manager software

- Download the software directly onto your PC
- Connect the service unit to your PC via the USB port or Wi-Fi
- Remote Service starts in the ACX/ATX Manager software
- Your MAHLE partner or authorized service partner can connect remotely to your MAHLE service unit using the serial number
- The hydraulic schematic and components will be displayed
- Your service partner can control the service unit and individual components or correct errors remotely

A/C service unit accessories for A/C servicing



ROU – RECOVERY ONLY UNIT

Removes unknown and contaminated refrigerants from vehicle air conditioning systems simply and safely

- For refrigerants R134a and R1234yf
- It's all organized: One call is all it takes—transport, analysis, and disposal—automatically and with no paperwork



ACX UNIVERSAL FLUSHING UNIT FOR REFRIGERANTS R134A AND R1234YF

Flushing tank with support for flexible usage—entirely independent of the A/C service unit location and model

- Direct access to refrigerant filter for fast replacement
- Flexible application: HP hose connector adapter set for various A/C service units



ArcticPRO® LD-2 DUAL-MODE LEAK DETECTOR

The LD-2 ArcticPRO® is a dual-mode leak detector featuring both electronic sensor and patented UV detection modes

- The solid electrolyte sensor technology detects refrigerants R134a and R1234yf
- The digital display also works independently of the audible alarm and sensitivity level, allowing precise location of the leak source



ACX RFID REFRIGERANT ANALYSIS UNIT

External analysis unit for the MAHLE ACX A/C service unit for refrigerant R1234yf

- Meets German Association of the Automotive Industry (VDA) specifications
- Simple, automatic operation and instant measurement result

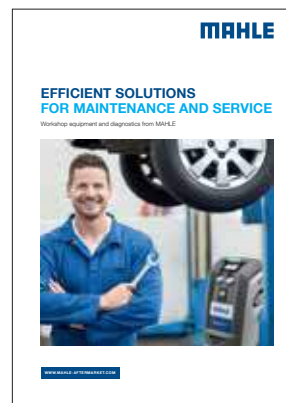


NITROGEN/HYDROGEN LEAK DETECTOR KIT

Leak detector kit

- Kit for identifying LEAKAGES in air conditioning systems
- Kit comprises: forming gas bottle, leak detector for forming gas, and pressure regulator

You'll find detailed information about our complete A/C service range in our brochure "Efficient solutions for maintenance and service."



WORKSHOP EQUIPMENT & DIAGNOSTICS: AUTOMATIC TRANSMISSION SERVICE UNITS

AUTOMATIC TRANSMISSION SERVICING— SIMPLE AND FULLY AUTOMATED

User-friendly design combined with state-of-the-art technology—with the MAHLE FluidPRO®. Our automatic transmission flushing units stand out thanks to their ease of use and automated flushing process.

FluidPRO® ATX 180

Automated service procedures to meet the highest requirements and purity standards:

- **No contamination of the oil—ensured by two pumps, separate oil circuits, and an automated cleaning process**



ADVANTAGES AT A GLANCE

FluidPRO® for automatic transmission servicing

- ✓ Fully automated
- ✓ Intuitive operation
- ✓ Safe and convenient change of oil type

→ COMING SOON FROM MAHLE

The starter unit FluidPRO® ATX 150 will soon be launched in the European market in addition to our professional unit FluidPRO® ATX 180. This new unit is also sure to impress with many benefits for service pros.

WORKSHOP EQUIPMENT & DIAGNOSTICS: EMISSIONS TESTING MEASURING INSTRUMENTS

EVEN MORE SOLUTIONS— FOR EFFICIENT SERVICING

“Our new EmissionPRO® 180 is the outstanding result of our cooperative development and production efforts with BRAIN BEE.”

Olaf Henning—Corporate Executive Vice President and General Manager MAHLE Aftermarket



ADVANTAGES AT A GLANCE

EmissionPRO® 180—MAHLE's complete emissions testing package

- ✓ Windows-based emissions testing station
- ✓ Can be used as a mobile or stationary unit
- ✓ Can be configured to suit individual customer demands

EmissionPRO®

Reliable exhaust gas measurement for diesel and gasoline engines

- Meets emissions testing guideline 5.01
- Software separation of calibration and user interface
- Modular design
- Open PC solution
- Integrated operating instructions
- Possible to integrate diagnostics and guided troubleshooting
- Intuitive software
- Universal rpm measurement module with data transfer via USB or Bluetooth
- A powerful vehicle communication interface for reading the error memory
- A convenient rolling cart with printer, keyboard, mouse, 24-inch monitor, and computer

TechPRO® diagnostic tool



TechPRO® is easy to use and precisely tailored for use in workshops. The unit reads out data and errors, displays solutions, allows component diagnostics, and offers component coding.

TechPRO® 180

The world's fastest diagnostic tool

- Ready to start vehicle diagnostics within just seven seconds
- Easy to operate
- Integrated technical information (wiring diagram, fault list, status screen)
- Functions: reads data—reads errors and displays solutions; single-part diagnostics and component coding
- Touch screen and Wi-Fi
- Based on TecDoc
- Compatible with almost 90% of all vehicles in EU9 countries



Software for multibrand diagnostics (available from Q1 2019).

TechPRO® ADAS (advanced driver assistance systems)

Simple and reliable calibration of driver assistance systems.

This tool allows workshops to adjust and calibrate driver assistance systems quickly and easily—using only one digital calibration panel. This saves time and money.

The tool is continuously updated online and expanded to cover more vehicles. With this intuitive and future-proof solution, MAHLE is setting new benchmarks in this promising product group.



SALES & LOGISTICS

WHAT ALL OUR PRODUCTS INCLUDE.

The best vehicle parts are in the right place at the right time. MAHLE Aftermarket operates more than a dozen logistics centers and numerous regional support points at strategic locations in Europe, North and South America, and Asia— with an optimized flow of goods and the best possible availability.

MAHLE products are among the most sought-after on the automotive parts market—by genuine buyers and counterfeiters alike. That's why the packaging used for our engine components, turbochargers, and thermostats now features a special security label. It combines several security features, such as the VeoMark® and MAPP code, which are linked together to provide the trade with maximum protection against counterfeiting.

Our logistics centers and sales branches are wherever you need us to be—in Argentina, Brazil, China, Dubai, France, Germany, Great Britain, India, Japan, Mexico, Poland, Russia, Singapore, South Africa, Spain, Sweden, Turkey, Ukraine, and the USA.

25 locations worldwide

1,600 employees

25,000 sales partners

150,000 spare parts

100% OE quality



MAHLE Aftermarket services

Take advantage of our extensive range of information, advice, and services:

MPULSE—DIGITAL & PRINT

The customer magazine from MAHLE Aftermarket reports on all the relevant aftermarket topics: product information and background knowledge, technology tips for workshops, fitting instructions and videos, trends and new developments, as well as exciting stories and opportunities to get involved and win prizes.

TECHNICAL MESSENGER

Valuable technical information and the latest tips on all aspects of the maintenance and repair of MAHLE products—easily and conveniently by e-mail. Technical Messenger is published regularly and is a free service.

DAMAGE BROCHURES AND TECHNICAL POSTERS

We provide you with practical support using detailed images and informative documents. Not only are technical posters always on hand, they also offer further benefits, assisting with diagnostics, disassembly, and reassembly. Damage brochures for engine components/filters and turbochargers help identify causes of defects and show how they can be avoided.

HIGH-QUALITY TRAINING COURSES

MAHLE Aftermarket product experts can travel to you—with a trunk full of expertise. Alternatively, you and your employees can visit us for practice-oriented seminars. In either case, our high-quality training courses will bring your technological know-how up-to-date.

MAHLE E-SHOP

As a wholesaler, you can now order all MAHLE products from a single platform—an exclusive service that's fast, easy, and secure. **Benefits for you:** product images make it easier and quicker to identify items, availability and purchase prices are displayed immediately, and you can use MAHLE SAP numbers for orders and inquiries.

CATALOGS & ONLINE TOOLS

You'll also find all our product catalogs and information online—our customer information system (CIS) provides you with firsthand information about all our new products.

BROCHURES AND FLYERS

Use our materials, including brochures and flyers, to learn and inform your customers about our comprehensive range of services. Ask your MAHLE sales partner for details.

ADVERTISING AND POS MATERIALS

With our attractive advertising materials, we want to ensure that you and your customers don't forget us. We use our POS materials to keep you up-to-date about important product information, news, and promotions—delivery is straightforward, quick, and direct to you.



→ INTERESTED?

Ask your MAHLE sales partner for details—he or she will be happy to assist you further.

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www.mpulse.mahle.com