



PIERBURG



# PRODUCT RANGE

OIL LEVEL AND OIL PRESSURE SENSORS –  
NEW TO THE SENSOR RANGE

TAKING RESPONSIBILITY IN A CHANGING WORLD



RHEINMETALL

# OIL LEVEL AND OIL PRESSURE SENSORS

## FOR OPTIMUM ENGINE OIL SUPPLY

Motorservice has included oil level sensors and oil pressure sensors from the Pierburg brand in its product range, making use of Pierburg's proven expertise in sensor technology and oil supply. The new sensors expand the existing portfolio and provide repair shops with reliable solutions for precise motor monitoring.

The oil level sensors are currently available for a worldwide fleet of more than 93 million passenger cars. With these oil pressure sensors, Motorservice covers over 38 million passenger cars and commercial vehicles.

Supplying the engine with the appropriate engine oil is essential for smooth engine running and for the durability of the engine. Whether it's an oil cooler, oil pump, oil filter, oil pressure sensor or oil level sensor: Motorservice focuses on quality and expertise. The oil level and oil pressure sensors regulate the optimum supply of engine oil to all moving parts and thus provide lasting protection against engine damage.



### OIL LEVEL SENSORS

The oil level sensor records the amount of oil in the engine – depending on the operating state – and is a central component of the engine management system. Nowadays, the sensor is often mounted on the bottom of the oil pan and measures the oil level. Depending on the version, the sensor also detects the temperature and the engine oil grade. This information is sent to the control unit.

Oil level sensors are available in three categories: float, ultrasound and heat. Motorservice offers the ultrasonic type of oil level sensors.

The ultrasonic sensor is mounted in the oil pan from below and emits ultrasonic waves in the oil. These are reflected by the surface of the oil (air / oil surface). The sensor measures the time from the transmission of the ultrasonic wave to the arrival of the reflected ultrasonic wave. In this way, the fill level can be measured and output precisely. To prevent errors, an average is calculated from several measurements. In addition, the engine control unit detects special situations, such as engine start. The ultrasonic sensors also detect the temperature via another measuring element. This also has an influence on the measurement. Special advantages of the sensor are short response times and high accuracy.



In addition to oil level sensors, the Motorservice range also includes engine oil pans. The sensors are compatible with the engine oil pans in some cases. You can find further information on the website.



## OIL PRESSURE SENSORS

The oil pressure sensor continuously measures the oil pressure in the engine and sends the information to the engine control unit. The sensor thereby ensures a sufficient oil supply and prevents consequential damage. Modern vehicles also use the data from the oil pressure sensor for optimum engine performance and optimised fuel consumption. Unlike oil pressure switches, which only trigger an alarm when the oil pressure falls below a certain value, oil pressure sensors provide precise values.

If the oil pressure sensor is triggered when the oil pressure is too low, this can, for instance, indicate oil loss, but may also be the result of a defective oil pump or other defects.

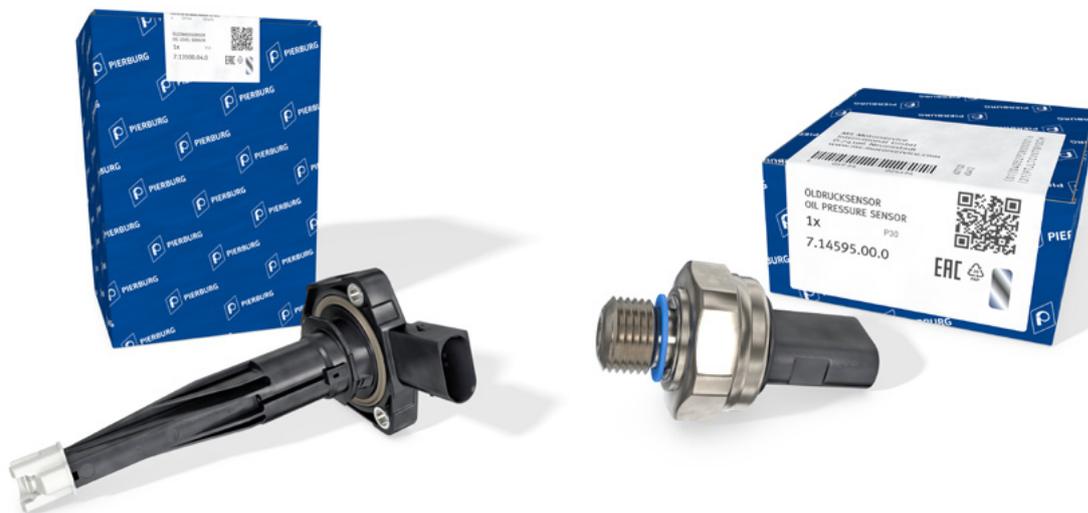
A piezoresistive cell measures the engine oil pressure. The piezoresistive effect is based on the change in electrical resistance in a material under pressure (or tension). An expansion measuring device can be used for this purpose. Alternatively, capacitive sensor elements are used to measure the pressure. The sensor processes this information and sends the pressure values to the engine control unit via a PWM (pulse width modulation) signal.

## OIL LEVEL SENSORS

Item no.	OEM	Ref. no.*	Example applications
7.13500.00.0	BMW	12 61 7 607 910	5 Touring (E61) 525 d xDrive, 6 Cabriolet (F12) 640 i xDrive, X6 (E71, E72) xDrive 30 d
7.13500.01.0	BMW	12 61 7 501 786	5 SERIES (E60) 520 Li, Z4 Roadster (E89) sDrive 28 i
7.13500.02.0	BMW	12 61 7 638 341	4 Cabriolet (F33, F83) 428 i xDrive
7.13500.03.0	BMW	12 61 5 A74 0A3	3 (G20, G80, G28) M340 d Mild Hybrid xDrive, 5 Touring (G31) 520 d Mild Hybrid xDrive
7.13500.04.0	BMW	12 61 8 638 755	4 Gran Coupe (F36) 440 i xDrive
7.13500.05.0	BMW, Mini	12 61 5 A74 0A2	X5 (G05, F95) xDrive 45 e Plug-in Hybrid
7.13500.06.0	Audi	06K 907 637 B	Atlas (CA1, CA2, CA3) 2.0 TSI 4motion, Magotan (B8L, 0B2, 0B3) 380 TSI
7.13500.07.0	Audi	03C 907 660 T	Passat Alltrack B7 Variant (365) 1.8 TSI, Passat B7 (A42, A43) 1.8 TSI
7.13500.08.0	Land Rover, Volvo	LR010354, 30757802	Freelander 2 (L359) 3.2 4x4, XC60 I SUV (156) T6 AWD
7.13500.09.0	Audi	06E 907 660	Passat B6 Variant (3C5) 2.0 TFSI, Scirocco III (137, 138) 2.0 TFSI
7.13500.10.0	Audi, Porsche	03C 907 660 S	A6L C7 (4X8, 4XL) 50 TFSI quattro, A4 B8 Avant (8K5) 3.0 TFSI quattro
7.13500.11.0	Audi, Porsche	06M 907 637 B	A4 Allroad B9 (8WH, 8WJ) 50 TDI quattro, A6 Allroad C7 (4GH, 4GJ) 3.0 TDI quattro
7.13500.12.0	Audi	03C 907 660 AA	A7 Sportback (4GA, 4GF) 3.0 TDI quattro, Q7 Van (4LB) 3.0 TDI quattro
7.13500.13.0	Audi	06M 907 637 A	Touareg (CR7, RC8) 3.0 R 4motion, Q5 Sportback (FYT) SQ5 TFSI quattro
7.13500.14.0	Audi, VW	04E 907 660 C	Q3 (8UB, 8UG) 1.4 TFSI Flex, Octavia IV Combi (NX5, PV5) 1.4 TSI
7.13500.15.0	Alpina, BMW, BMW (Brilliance)	12 61 8 608 780, 12 61 8 507 675, 12 61 7 636 295	X5 (F15, F85) xDrive 50 i, 5 Series (F10, F18) 535 Li, 4 Coupe (F32, F82) 435 i xDrive
7.13500.16.0	Audi, VW	1J0 907 660 B	A6 C5 (4B2, 4B4) 3.7 quattro, A4 B6 (8E2) S4 quattro
7.13500.17.0	Audi, Porsche	1J0 907 660 F	Ibiza IV SC (6j1, 6P5) 1.4 TSI Cupra, A6 C5 Avant (4B5, 4B6) 1.8 T quattro
7.13500.18.0	Ford, Land Rover	AG9G 6C624 AC, LR024971	Discovery Sport (L550) 2.0 4x4, Range Rover Evoque (L538) 2.0 T 4x4, Mondeo / Zhisheng 2.0 GTDi240
7.13500.19.0	Jaguar, Land Rover	AJ8 12432, LR012640	Range Rover Sport I (L320) 3.0 D 4x4, Discovery IV (L319) 5.0 V8 4x4
7.13500.20.0	Audi, VW	06L 907 660, 06L 907 660 B, 06L 907 660 D, 06L 907 660 H, 06L 907 637	A4 B9 Avant (8W5, 8WD) 2.0 TFSI, Q5 (FYB, FYG) 2.0 TFSI quattro, A4 B9 Avant (8W5, 8WD) 2.0 TFSI g-tron, A5 Cabriolet (F57, F5E) 2.0 TFSI Mild Hybrid
7.13500.21.0	Mercedes-Benz	A 006 153 30 28	M-Class (W163) ML 270 CDI (163.113), Sprinter 3-t bus (B903) 311 CDI, Sprinter 4-t van (B904) 411 CDI 4x4
7.13500.22.0	Mercedes-Benz	A 006 153 27 28, A 000 542 78 18	CLK (C209) CLK 55 AMG (209.376), S-Class Coupe (C215) CL 600 (215.376), CLK Cabriolet (A209) CLK 55 AMG (209.476)
7.13500.23.0	Mercedes-Benz	A 005 153 94 28, A 640 905 00 00	A-Class (W168) A 160 CDI (168.006), Vaneo (414) 1.7 CDI (414.700)
7.13500.24.0	Mercedes-Benz	A 001 153 19 32	CLA Coupe (C117) CLA 200 (117.343), A-Class (W176) A 160 (176.041)
7.13500.25.0	Mercedes-Benz	A 001 153 13 32, A 001 153 03 32, A 001 153 11 32	M-Class (W166) ML 500 4-matic (166.073), S-Class (W221, V221) S 65 AMG (221.179), E-Class Coupe (C207) E 500 (207.373)
7.13500.26.0	Mercedes-Benz	A 091 905 71 01, A 091 905 42 01, A 177 905 01 00	C-Class (W205) AMG C 63 S (205.087), E-Class T-Model (S213) E 220 d 4-matic (213.205), AMG GT Roadster (R190) GT C (190.480)
7.13500.27.0	Mercedes-Benz	A 091 905 72 01	C-Class T-Model (S205) AMG C 63 (205.286), AMG GT Roadster (R190) GT C (190.480)
7.13500.28.0	Mercedes-Benz	A 001 153 05 32	CLK (C209) CLK 200 CGI (209.343), C-Class (W203) C 200 Kompressor (203.042)
7.13500.29.0	Mercedes-Benz	A 006 153 28 28, A 000 905 04 01	C-Class T-Model (S203) C 220 CDI (203.208), G-Class (W461) G 300 CDI (461.333)

## OIL PRESSURE SENSORS

Item no.	OEM	Ref. no.*	Example applications
7.14595.00.0	BMW, PSA	12617592532, 7592532, 9802152780	C4 Cactus 1.2 PureTech 130c, Astra Mk VIII (L) Sports Tourer 1.2
7.14595.01.0	PSA	9674035780	C4 Cactus 1.2 THP 110, Astra Mk VIII (L) Sports Tourer 1.2
7.14595.02.0	GM	12637356, 55488247	Colorado Crew Cab Pickup 3.6, Astra K van / hatchback 1.6 CDTI
7.14595.03.0	Ford	FM5Q-9D290-AA	B-MAX Van (JK) 1.5 TDCi, Mondeo V Turnier (CF) 1.5 TDCi
7.14595.04.0	GM	12621234, 12673134	TS Sport Wagon 6.2 V, Suburban 2500 SUV 6.0 Flex 4WD
7.14595.05.0	Audi, VW	04C 906 060 C, 04C906060C	A5 (8T3) 2.0 TDI, Q2 (GAB, GAG) 35 TDI quattro
7.14595.06.0	FCA	05149064AA, 05149064AB	RAM 1500 Crew Cab Pickup 4.7, Grand Voyager V (RT) 2.8 CRD
7.14595.07.0	GM	12621649, 12674782	Rendezvous 3.6 AWD, ATS Coupe 3.6 Flex AWD
7.14595.08.0	FCA	05149062AA	300C (LX, LE) 5.7 AWD, Grand Cherokee III (WH, WK) 5.7 V8 4x4
7.14595.09.0	FCA	68295556AA	Grand Cherokee Van (WK2) V6 VVT, Wrangler III (JK) 3.6 V6
7.14595.10.0	GM	12616646	Avalanche 5.3 Flex-Fuel, Corvette Convertible (C6) Z06 7.0, Silverado 1500 6.0 AWD, Tahoe (B2W) 5.3 Flex-Fuel AWD
7.14595.11.0	Nissan, Renault	25070-CD00A	350Z Coupe (Z33) 3.5 (BAZ33), 350Z Roadster (Z33) 3.5 (BAZ33)
7.14595.12.0	Audi, VW	06E 906 054	A3 Saloon (8VS, 8VM) RS3 quattro, A5 (F53, F5P) RS5 TFSI quattro, TT Roadster (FV9, FVR) 2.5 RS TFSI quattro, A8 D4 (4H2, 4H8, 4HC, 4HL) 3.0 TFSI quattro
7.14595.13.0	HKMC	94750-2M454	Tucson (TL, TLE) 1.6 CRDi Hybrid 48V all-wheel drive
7.14595.14.0	Daimler Truck, Detroit Diesel	A0071530828, A0111539228	Actros MP2 / MP3 2536 LS, Travego (O 580) O 580-16 RHD, O 580-17 RHD
7.14595.15.0	DAF, Kenworth, Paccar, and Peterbilt	1826281, 2041678, 2127356	XF FTG 460, FTN 460, F 105 FAS 105.510, FAR 105.510, CF FT 450 Hybrid
7.14595.20.0	BMW	11 61 8 647 488	3 Gran Turismo (F34) 320 d, 2 Active Tourer (F45) 220 d xDrive, X1 (F48) xDrive 25 i
7.14595.21.0	Jeep	68295557AA, K68295557AA	Cherokee (KL) 2.4, Cherokee (KL) 2.4 4x4
7.14595.22.0	Jeep	68334877AA, K68334877AA	Durango (WD) 3.6, Wrangler IV (JL) 6.4, Grand Cherokee IV (WK, WK2) 6.2 i V8 4x4



All content including pictures and diagrams is subject to change. For assignment and replacement, refer to the current catalogues or systems based on TecAlliance. Names, descriptions and numbers of engines, vehicles, products, manufacturers etc. are mentioned solely for the purpose of comparison.

\*The reference numbers given are for comparison purposes only and must not be used on invoices to the consumer.

# SENSORS FROM PIERBURG –

TAILOR-MADE OFFER, WIDE MARKET COVERAGE



## EXHAUST GAS TEMPERATURE SENSORS

Exhaust gas temperature sensors monitor the hot exhaust gas flow and protect components from overheating.

Typical applications include protecting components which are sensitive to temperature, such as turbochargers and all forms of catalytic converters, monitoring the free-burning process of the diesel particulate filter, controlling the optimal temperature range for catalytic converters and measuring the EGR exhaust gas temperature as part of on-board diagnostics (OBD). In the event of critical overheating, the control unit responds by taking appropriate action to reduce the temperature, e.g. through reduced performance (limp home function).



## EXHAUST GAS PRESSURE SENSORS

In addition to lambda sensors and exhaust gas temperature sensors, exhaust gas pressure sensors are the third product group of exhaust gas sensors available from Pierburg.

This group includes the following types of sensor:

- Differential pressure sensors are mainly used to determine how soiled the particulate filter is. They can also be used to detect whether e.g. an air filter or an EGR cooler is clogged or blocked.
- Exhaust back pressure sensors protect the engine and turbocharger against excess pressure.



## LAMBDA SENSORS

Lambda sensors measure the residual oxygen in the exhaust gas. This produces a lambda value, which the engine management system uses to regulate the mixture composition for the most optimal combustion possible.

Lambda sensors are the most important element in engine management systems in terms of ensuring perfect engine running with low emissions.

High operating temperatures and aggressive exhaust gas place high demands on lambda sensors. You should therefore choose products from the specialist for emission control.



## FUEL PRESSURE SENSORS

Also referred to as fuel rail pressure sensors, these components supplement Pierburg's existing range of fuel supply and sensor products.

In many cases, the rail can only be purchased as a complete unit along with all the attachments. However, Motorservice offers the pressure sensor separately as a spare part.



## AIR MASS SENSORS

Air mass sensors have been used in almost every vehicle for the last decade, and have become one of the most important components in engine management. They are therefore a key component in the air supply system and for emission control.

The air mass sensor records the air mass flowing into the engine. Its signal is used to calculate the injected fuel quantity, and in diesel engines also for regulating the exhaust gas recirculation.

OUR SENSORS IN OE QUALITY HAVE PROVEN THEMSELVES MILLIONS OF TIMES OVER ACROSS THE GLOBE.



#### **NITROGEN OXIDE / NOx SENSORS**

These sensors play an important part in reducing harmful nitrogen oxide, or NOx for short. But high operating temperatures and aggressive exhaust gases make high demands of NOx sensors. So this is why Motorservice is offering NOx sensors on the aftermarket from its sister company Pierburg, with the reliable quality you associate with original manufacturers.

With diesel engines, NOx sensors help inject the right amount of urea in the SCR catalytic converter (SCR = selective catalytic reduction). If two NOx sensors are fitted, the second NOx sensor monitors the function of the SCR catalytic converter.

NOx sensors are installed as standard in utility vehicles that conform to Euro VI or higher. In the case of petrol engines with direct injection, the NOx sensor monitors the load on the NOx catalytic converter.



#### **AIR PRESSURE SENSORS**

Air pressure sensors supply important input variable for the engine control system. The commonly used abbreviation "MAP sensors" stands for "manifold absolute pressure".



#### **SENSORS FOR THE TYRE PRESSURE MONITORING SYSTEM**

Motorservice has expanded its sensors portfolio to include active sensors for the tyre pressure monitoring system (TPMS).

With the active (direct) TPMS, a battery-powered sensor is fitted to each wheel rim and constantly measures air pressure and temperature in the tyre. The data is sent via wireless transmission to the trip computer. The advantage is that air pressure and temperature can be accurately monitored for individual wheels in real time.

The sensors are available as clamp-in sensors with cap nut and as snap-in sensors with rubber coating. These are active sensors (433 MHz) in the direct TPMS.



#### **WHEEL SPEED SENSORS**

Wheel speed sensors are among the most important sensors in a vehicle. Their signal serves as an input variable for safety and comfort systems, such as the anti-lock braking system (ABS), electronic stability control (ESC), traction control system (TCS) or in the tyre pressure monitoring system. In this way, they make a direct contribution to driving safety, driving comfort and fuel consumption.

**HEADQUARTERS:**

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