Engine Clean
(technical)

Combustion of the fuel/air mixture in petrol and diesel engines inevitably produces residues which can either be solid or liquid. The relative quantities of the carbon particulates, unburnt fuel residues, oxidation products, nitrogen oxides, acid compounds, fine silica and dust particles as well as the water resulting from the combustion depend on the running conditions of the engine and the type of fuel which is used. Foreign materials also often appear due to the ageing of the oil and the frequently high thermal stresses to which it is subjected.

These residues and decomposition products, which are mainly oil insoluble, can account for as much as 10 % of the mass of the oil in the engine and oil circuit and lead to a series of undesirable effects.

Resin and asphalt-type oxidation products give rise to deposits on the metal surfaces and oil thickening as well as sludge deposits on the engine components, particularly in the grooves of the piston rings and the upper region of the cylinder. Acidic combustion products and condensed water lead to corrosion on unprotected metal surfaces. Carbonised and lacquer-type deposits gum up the piston rings and have a detrimental effect on their sealing properties. This allows more combustion gases (blow-by gases) to reach the engine oil in the oil sump where they contaminate the oil and have a detrimental effect on its lubricating properties. This can result in piston eroders and increased engine wear. Sludge deposits cause blockages in the oil channels and oil filter. The resulting lack of oil at the friction sites then leads to increased wear and can, under unfavourable conditions, lead to engine breakdown.

High-quality engine-oil formulations contain highly effective additives, so-called detergents and dispersants, which coat the foreign particles and impurities and keep them in suspension in the engine oil. This prevents soluble and insoluble residues from agglomerating in the engine oil or sump and settling as described in the engine components. During the next oil change, the suspended particles are then drained from the oil circuit along with the old oil.

Today's engines which are optimised to minimise consumption and exhaust emissions using the corresponding lean-combustion ideas are subjected to extreme running conditions. Frequent use in cold weather and for short journeys, stop-go driving in towns and a high proportion of switching between idling and full-load running also give rise to harmful residues in the engine, as do the higher specific demands placed on the oil due to lower oil fill levels, longer periods between oil changes and increased thermal stress on the lubricant. In spite of the significant increase in the technical standard of engine oil quality, these conditions give rise to contaminated engine oil and impurities in the whole oil circuit as described, inadequate engine performance, increased oil and fuel consumption, worsened exhaust emissions and deficient lubrication with excessive engine wear.

Engine Clean flushes out and cleans the engine from inside. Due to their polar properties, the highly effective detergent and dispersant additives release the sludge and lacquer formers in the engine, peptise and solubilise (envelope) the solid particles and liquid impurities and then neutralise acidic combustion products. The oil circuit is cleared of deposits, residues and adherents. When an oil change has been carried out using this product, the fresh oil can realise its full potential and is not hindered by old contamination left over from the previous oil. An engine which has been cleared of deposits develops its full performance again, shows the optimum exhaust emission behaviour and is enabled to run with less wear.

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Engine Clean is a development product based on highly effective modern additive technology. The selected detergent and dispersing components have been tested in numerous laboratory and practice-orientated field trials using the anti-wear technology which has been created especially for engine cleaning.

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As part of the field studies on different makes of car with very different running performances from 30,000 to in excess of 100,000 km, it has been demonstrated that even for engines which are not excessively contaminated with sludge, 20 to 50 % more of the typical wear metals (iron and aluminium etc.) are removed during oil changes using "Engine Clean". Of course, these figures are found to be much higher when atomic absorption spectroscopy is used to analyse the engine oil before engine cleaning and the used oil containing the active components. The quantity of wear metals is doubled or tripled when the treatment is carried out on a severely contaminated motor vehicle.

Likewise, the discharge of other oil insoluble impurities such as silicon as a component of sand or dust can increase by an average of 20 %.
The highly effective combination of detergents and dispersants significantly reduces discolouring i.e. lacquer deposits on the pistons, in the grooves and on the lands.
An engine which has been cleaned of deposits and contamination and is filled with fresh oil which is not contaminated with old impurities is able to develop its full performance characteristics.

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Our information is based on thorough research and may be considered reliable, although not legally binding.

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