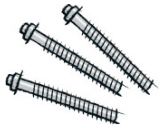
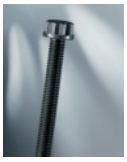
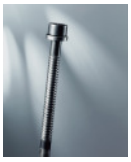
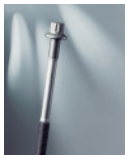


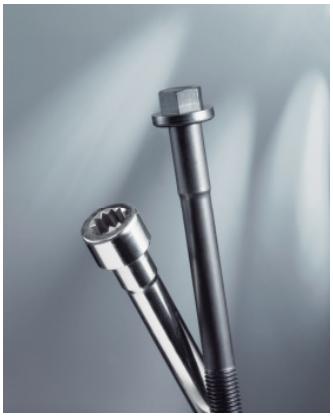
Only new cylinder-head bolts provide 100% reliability.







The new generations of engines feature improved sealing systems that have been tailored to the engine design. To ensure that the engine will continue to enjoy a long service life, it is absolutely essential to restore it to its original condition when overhauling the cylinder head. The role played by the cylinder-head bolts is crucial to this process, as they are the elements of the cylinder-head sealing system that exert the necessary overall force on the cylinder-head gasket.



They make sure that there is an adequate, specifically distributed sealing force acting on the cylinder-head gasket under all engine operating conditions. This can only be achieved using a new cylinder-head gasket and new cylinder-head bolts.

In addition, new cylinder-head bolts have to be installed using the tightening procedure and sequences developed by the engine and gasket manufacturers. The tightening process using torque and angle of rotation results in a targeted use of the bolt-specific properties. In the process, minuscule differences in bolt force are achieved. This is done by tightening the bolts beyond the yield point into the plastic deformation range.

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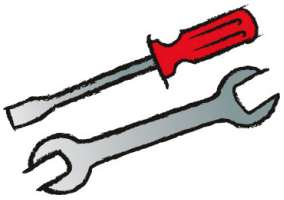

A bolt that has already been in use will not only exhibit a plastic elongation associated with a reduction of shaft and/or thread cross-section, it will also have undergone changes in the strength and expansion properties of the bolt material. As a result, uniform distribution of stress and elasticity in the bolt shaft, which offsets the component elongations and relative movements in modern engines, is no longer ensured.

Another consideration is that in used bolts the threads are deformed on one side due to the high bolt force. In their original condition, the fabricated threads have a tolerance of 6g, i.e. in the hundredths of mm range, but after just one use they are outside the tolerance values. Even the specially developed surface coatings of cylinder-head bolts, guaranteeing particularly good friction conditions under the head contact and in the thread, only achieve the required friction coefficients of 0.12 – 0.14 µ when they are new and undamaged.

This is why the specifications of engine and gasket manufacturers have to be observed for proper repair of the cylinder-head sealing system. Only by doing so will optimum clamping and proper sealing be assured.

- Use new cylinder-head gasket and new cylinder-head bolts
- Adhere to specified tightening torques and angles
- Follow specified tightening sequence
- Use cleaned engine components with no warping
- Employ only trained specialists to install parts
- Use high-quality tools

On no account may used bolts with plastic elongation be re-used. By following this advice, you will avoid consequential damage such as leaks as well as the associated repair costs, customer dissatisfaction and damage to your company's reputation.

- In Proven quality for almost all passenger cars and commercial vehicles
- Assorted for each engine repair job
- Packed in special box with thread protection
- Fast and convenient supply direct from the gasket manufacturer

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