

Cracking connecting rods – The new manufacturing process

Almost every internal combustion engine uses connecting rods to convert the linear movement of the pistons into the rotational movement of the crankshaft. If split connecting rods are used, the connecting rod eye lower end must be separated into the connecting rod saddle and bearing cap.

Until now, these two halves were produced separately and then matched up together at a later point. This process required numerous working steps during production and a high level of dimensional accuracy.

Cracking – the technology

This working process has been rationalized for high performance engines. The connecting rods used here are initially produced as single part precision forged parts. The connecting rod bearing is then broken apart at a predefined point by fracture splitting, so-called cracking.

Process monitoring

The entire cracking process only takes milliseconds. The quality of the fracturing process and the fracture can be determined from the force/displacement curve.

The fast and highly stable piezo force sensors in the PACeline series from HBM enable precise and loss-free determination of the breaking force directly in the force flow of the fracturing man-

drel. The robustness and rapidity of the piezo technology used here, together with the high rigidity of the piezo sensors, is perfectly designed for this tough industrial application.

The connection and commissioning of the entire measurement chain is automated by the TEDS functionality of the amplifier and the process monitoring module and is error-free. The process controller MP85A-FASTpress has a highly accurate measured value acquisition rate in the 100µ seconds range and can monitor the signal curve via limit values, tolerance window and an envelope curve.

■ Michael Guckes, HBM

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Fracture splitting (cracking) of a conrod at KRAUSE & MAUSER, Germany, the technology leader for this process

Photos: KRAUSE & MAUSER

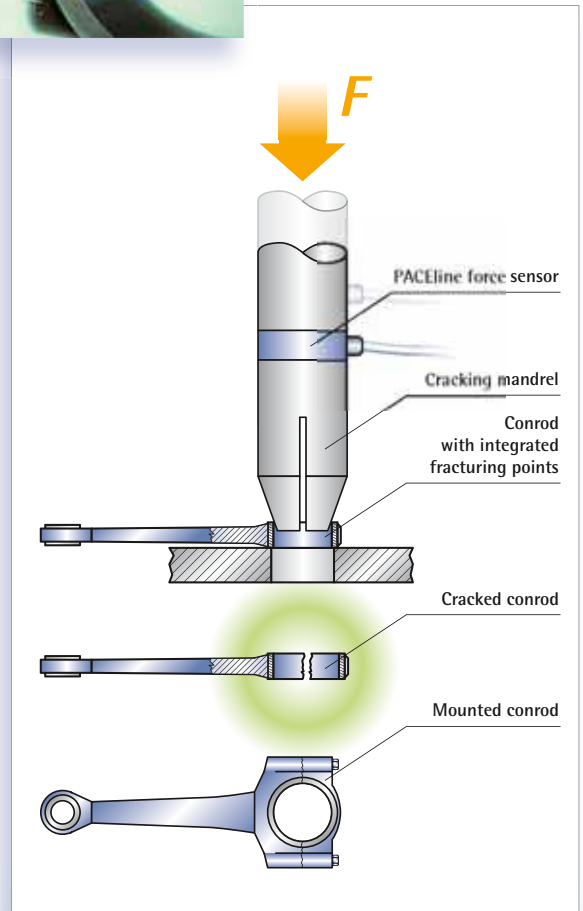


Fig. 1: The connecting rod is produced as a single precision forged part and is then fractured at a defined point.

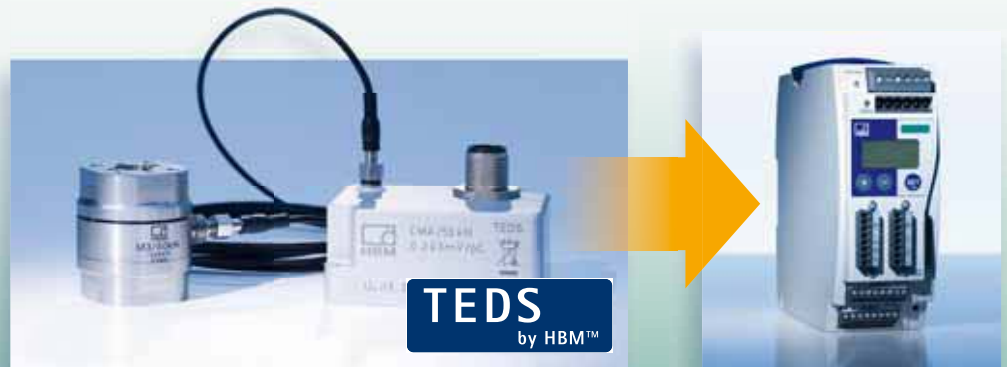


Fig. 2: Piezo measurement chain with process controller MP85A FASTpress