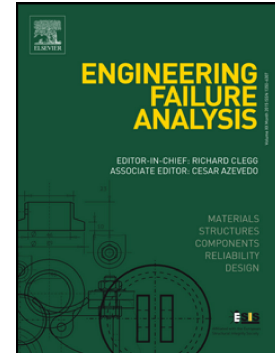


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Investigation into diesel engine cylinder head failure

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Abstract: The failure analyses of the cylinder head for diesel engine, including the chemical composition, microstructure, static mechanical properties, crack initiation and propagation, were studied in this paper. Based on the results, it was found that the most dangerous site analyzed by the dye penetrant inspection is the thinnest area of the bridge zone. In high temperature, the oxidation phenomenon becomes severe. The cracks initiate from the boundary between the graphite and ferrite matrix in the surface of the cylinder head, and the oxide promotes the crack propagation. Failure of the engine cylinder head is mainly caused by the thermal fatigue, which was proved by the result of finite element method and crack morphology. Furthermore, the improvement of thermal conductivity of material is a useful way to enhance the service life of engine.

Keywords: Cylinder head; Failure analysis; Finite element method; Thermal fatigue; Crack morphology.

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