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Nota di contenuto	CRITICAL COMPONENT WEAR IN HEAVY DUTY ENGINES; Contents; List of Contributors; Preface; Acknowledgements; PART I: OVERTURE; 1 Wear in the Heavy Duty Engine; 1.1 Introduction; 1.2 Engine Life; 1.3 Wear in Engines; 1.3.1 Natural Aging; 1.4 General Wear Model; 1.5 Wear of Engine Bearings; 1.6 Wear of Piston Rings and Liners; 1.7 Wear of Valves and Valve Guides; 1.8 Reduction in Wear Life of Critical Parts Due to Contaminants in Oil; 1.8.1 Oil Analysis; 1.9 Oils for New Generation Engines with Longer Drain Intervals; 1.9.1 Engine Oil Developments and Trends; 1.9.2 Shift in Engine Oil Technology 1.10 Filters 1.10.1 Air Filter; 1.10.2 Oil Filter; 1.10.3 Water Filter; 1.10.4 Fuel Filter; 1.11 Types of Wear of Critical Parts in a Highly Loaded Diesel Engine; 1.11.1 Adhesive Wear; 1.11.2 Abrasive Wear; 1.11.3 Fretting Wear; 1.11.4 Corrosive Wear; References; 2 Engine Size and Life; 2.1 Introduction; 2.2 Engine Life; 2.3 Factors on Which Life is Dependent; 2.4 Friction Force and Power; 2.4.1 Mechanical Efficiency; 2.4.2 Friction; 2.5 Similarity Studies; 2.5.1 Characteristic Size of an Engine; 2.5.2 Velocity; 2.5.3 Oil Film Thickness; 2.5.4 Velocity Gradient;

## 2.5.5 Friction Force or Power

2.5.6 Indicated Power and Efficiency  
2.6 Archard's Law of Wear; 2.7 Wear Life of Engines; 2.7.1 Wear Life; 2.7.2 Nondimensional Wear Depth Achieved During Lifetime; 2.8 Summary; Appendix 2.A: Engine Parameters, Mechanical Efficiency and Life; Appendix 2.B: Hardness and Fatigue Limits of Different Copper-Lead-Tin (Cu-Pb-Sn) Bearings; Appendix 2.C: Hardness and Fatigue Limits of Different Aluminium-Tin (Al-Sn) Bearings; References; PART II VALVE TRAIN COMPONENTS; 3 Inlet Valve Seat Wear in High bmepl Diesel Engines; 3.1 Introduction; 3.2 Valve Seat Wear

3.2.1 Design Aspects to Reduce Valve Seat Wear Life  
3.3 Shear Strain and Wear due to Relative Displacement; 3.4 Wear Model; 3.4.1 Wear Rate; 3.5 Finite Element Analysis; 3.6 Experiments, Results and Discussions; 3.6.1 Valve and Seat Insert of Existing Design; 3.6.2 Improved Valve and Seat Insert; 3.7 Summary; 3.8 Design Rule for Inlet Valve Seat Wear in High bmepl Engines; References; 4 Wear of the Cam Follower and Rocker Toe; 4.1 Introduction; 4.2 Wear of Cam Follower Surfaces; 4.2.1 Wear Mechanism of the Cam Follower; 4.3 Typical Modes of; 4.4 Experiments on Cam Follower Wear

4.4.1 Follower Measurement  
4.5 Dynamics of the Valve Train System of the Pushrod Type; 4.5.1 Elastohydrodynamic and Transition of Boundary Lubrication; 4.5.2 Cam and Follower Dynamics; 4.6 Wear Model; 4.6.1 Wear Coefficient; 4.6.2 Valve Train Dynamics and Stress on the Follower; 4.6.3 Wear Depth; 4.7 Parametric Study; 4.7.1 Engine Speed; 4.7.2 Oil Film Thickness; 4.8 Wear of the Cast Iron Rocker Toe; 4.9 Summary; References; PART III LINER, PISTON AND PISTON RINGS; 5 Liner Wear: Wear of Roughness Peaks in Sparse Contact; 5.1 Introduction; 5.2 Surface Texture of Liners and Rings

5.2.1 Surface Finish

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### Sommario/riassunto

The critical parts of a heavy duty engine are theoretically designed for infinite life without mechanical fatigue failure. Yet the life of an engine is in reality determined by wear of the critical parts. Even if an engine is designed and built to have normal wear life, abnormal wear takes place either due to special working conditions or increased loading. Understanding abnormal and normal wear enables the engineer to control the external conditions leading to premature wear, or to design the critical parts that have longer wear life and hence lower costs. The literature on wear phenomenon r

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