

图书基本信息

书名：<<FISITA 2012 世界汽车工程年会论文集和摘要集>>

13位ISBN编号：9787564069872

10位ISBN编号：7564069872

出版时间：2013-1

出版时间：北京理工大学出版社

作者：中国汽车工程学会，国际汽车工程学会联合会 编

页数：1180

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内容概要

《FISITA 2012世界汽车工程年会论文集和摘要集》主要包括：Multi-Coil High Frequency Spark Ignition to Extend Diluted Combustion Limits、Multiple Injection and Boosting Benefits for Improved Fuel Consumption on a Spray Guided Direct Injection Gasoline Engine、Gray Cast Iron Cylinder Head Thermal Mechanical Fatigue Analysis、Development of FAW 2.0 L Turbocharged Gasoline Direct Injection Engine、Faw V6 High Performance Gasoline Engine for Executive Class Car、Air System Proposal and Testing for a Downsized Two-Stroke Diesel Engine等。

书籍目录

Volume 1 Advanced Internal Combustion Engines () Part New Gasoline Direct Injection (GDI) , Spark Ignition (SI) and Compression Ignition (CI) Engines and ComponentsF2012-A01-003A Novel Mechanism for Piston Deactivation Improving the Part Load Performances of Multi Cylinder EnginesF2012-A01-004Novel Crankshaft Mechanism and Regenerative Braking System to Improve the Fuel Economy of Passenger CarsF2012-A01-006Experimental Investigation on Fuel Spray Optimization in Gasoline Direct Injection EngineF2012-A01-012Improvement of Fuel Economy and Vehicle Performance Through Pneumatic Regenerative Engine Braking Device (Reneged) F2012-A01-013CAI Combustion of Gasoline and Its Mixture with Ethanol in a 2-Stroke Poppet Valve DI Gasoline EngineF2012-A01-016Technologies for the Next Generation of Downsized Gasoline EnginesF2012-A01-019Control System Development for Gasoline HCCI Engine Which Based on Heat ManagementF2012-A01-021The Effect ofAdvanced Combustion Control Features on the Performance of a Highly Downsized Gasoline engineF2012- A01-023HCCI Cycle-by-Cycle Combustion Phase Control Based on Ion Current Technology in GDI EngineF2012-A01-024Efforts on Fuel Economy Improvement of 1.3 L TGDI Gasoline EngineF2012-A01-026Development ofTwo-Stage Turbocharger System with Electric SuperchargerF2012-A01-027Effect of the Injection Method in DI CNG Engine on the Flame Propagation Process and Engine PerformanceF2012-A01-030Analysis ofthe Wear Behavior of Combustion Engine Components Using Radionuclide-TechniqueF2012-A01-031A Super Clean Diesel Vehicle for US LEV-III SULEV Category : Second Report ; Advanced A/F Control for NOx Reduction and for SCR Heat UpF2012-A01-033Research on Low Temperature Combustion of Homogeneous Charge Induced Ignition (HCII) in a Light-Duty Diesel EngineF2012-A01-039The Impact of Modified Piston in Two Stroke Engine on Toxic Emissions and Fuel ConsumptionF2012-A01-040Multi-Coil High Frequency Spark Ignition to Extend Diluted Combustion LimitsF2012-A01-041Multiple Injection and Boosting Benefits for Improved Fuel Consumption on a Spray Guided Direct Injection Gasoline EngineF2012-A01-042Gray Cast Iron Cylinder Head Thermal Mechanical Fatigue AnalysisF2012-A01-043Development of FAW 2.0 L Turbocharged Gasoline Direct Injection EngineF2012-A01-044Faw V6 High Performance Gasoline Engine for Executive Class CarF2012-A01-045Air System Proposal and Testing for a Downsized Two-Stroke Diesel EnginePart Fuel Injection and SpraysF2012-A02-003Spray Characteristics ofa Fuel Injector : a CFD StudyF2012-A02-008Co-Simulation Modeling of High-Pressure Fuel System and Engine Performance System and Control System in Common Rail Diesel EngineF2012-A02-011Applying a Diesel Spray Model with Different Size Distribution Functions to High Pressure Diesel Spray CasesF2012-A02-012Influence of Diesel Surrogates on the Behavior of Simplified Spray ModelsF2012-A02-013Coupled ID/2D/3D Modeling of Common Rail Injector Flow and Nozzle CavitationF2012-A02-014Predicting the Effect of Fuel Path Controllable Parameters on the Performance of Combustion Controlled Diesel Engine..... Volume 2 Advanced Internal Combustion Engines () Volume 3 Future Automotive Powertrains () Volume 4 Future Automotive Powertrains () Volume 5 Advanced Transmission System and DrivelineVolume 6 Vehicle ElectronicsVolume 7 Vehicle Design and Testing () Volume 8 Vehicle Design and Testing () Volume 9 Automotive Safety TechnologyVolume 10 Chassis Systems and Integration TechnologyVolume 11 Advanced Vehicle Manufacturing TechnologyVolume 12 Intelligent Transport System (ITS) & Internet of VehiclesVolume 13 Noise, Vibration and Harshness (NVH)

章节摘录

Research on Torque-Angle Tightening of High Strength Bolt in Internal Combustion Engine Wenfeng Zhan , Jian Wu , Fake Shao , Chuhua Huang Guangzhou Automobile Group Co. , Ltd. Automotive Engineering Institute , China

KEYWORDS - bolt , torque-angle tightening , elastic , plastic , elongation
ABSTRACT Research and/or engineering questions/objectives : Torque-angle tightening is widely used in the internal combustion engine. Actually , torque-angle tightening is an indirect method of length measurement tightening , used to make the bolt's plastic elongation rate right after tightening. Usually , the bolt's plastic elongation after tightening could only be measured by experiments. We researched on how to calculate the plastic elongation of the bolt after tightening when both elastic and plastic elongations occur , considering the tolerance of the torque and angle-what is the most important point but never be mentioned in most of the research.

Methodology : We calculated the bolt's preload and elongation after tightening based on the handbook of mechanical design on the assumption that all the elongation was elastic. At the same time we calculate the bolt's limited preload according to the VDI 2230 base on the material. Then we can work out the bolt's actual preload and plastic elongation and so on according to the two calculations mentioned above. All these were shown clearly in a figure. Finally we validated the calculation's result by experiments. **Results :** We found out a simple and efficient way to calculate the plastic elongation of the torque-angle tightening bolt , which was also proved coincident with the experiments. We can make sure the tighten method without the experiments , which was very useful when designing the high performance bolt connection. **Limitations of this study :** In order to calculate the stiffness of the bolt and boss exactly , we should use FEA method instead of conventional method , especially when the boss was more complicated than a simple cylinder.

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